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METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N.
Longitude, 72° 31′ 10″ W.

Height of instrumemts above ground, 51 feet.
Above sea level, 260 feet.

BULLETIN No. 1. JANUARY, 1889.

AMHERST, MASS.:
J. E. WILLIAMS BOOK AND JOB PRINTER.
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AMHERST, MASS.

Observations in this division began Jan. 1st. The present report is not as complete as was desired, owing to the unavoidable delay experienced in fully equipping the department; but it is hoped that the near future will remove all hindrances, and assure the best facilities for making the series of observations mentioned in the first bulletin issued by the Station.

The tower room of one of the dormitories has been especially fitted up for the work, and a full set of Draper's Self-registering Instruments purchased, and every precaution taken to insure accuracy and detail in noting the various meteorological phenomena.

The past month has been an exception and its parallel unknown for years. There has been very little rain and snow, and the weather unusually mild. The table of hourly temperatures, and column of remarks, will together convey a general idea of the weather the past month. An explanation of the following pages is deemed unnecessary as the headings themselves are considered sufficiently plain.

C. D. WARNER, Meteorologist.

APR 21 1914

BAROMETER.

REDUCED TO FREEZING.

Jan.	7 A. M.	2 P. M.	9 P. M.	Mean.	Maximum.	Time.	Minimum.	Time.
1	29.842	29.782	29.788	29.804	29.849	1 A. M.	29.751	11 P. M.
2	29.722	29.722	29.814	29.752	29.831	11 P. M.	29.722	4 A. M.
3	29.940	29.928	29.950	29.939	29.967	9 A. M.	29.877	1 A. M.
4	29.955	29.976	29.989	29.973	30.007	10 A. M.	29.952	0 A. M.
5	30.082	30.079	30.064	30.075	30.174	11 A. M.	29.960	12 P. M.
6	29.862	29.650	29.547	29.686	29.960	0 A. M.	29.480	12 P. M.
7	29.380	29.240	29.272	29.297	29.480	0 A. M.	29.230	1 P. M.
8	29.472	29.611	29.685	29.589	29.698	10 P. M.	29.312	0 A. M.
9	29.708	29.463	28.999	29.390	29.325	0 A. M.	28.922	10 P. M.
10	29.213	29.410	29.643	29.088	29.665	12 P. M.	28.977	0 A. M.
11	29.761	29.850	29.852	29.821	29.862	10 P. M.	29.665	0 A. M.
12	29.909	30.105	30.196	30.101	30.101	9 P. M.	29.862	0 A. M.
13	30 222	30.167	30.150	30.172	30.221	10 A. M.	30.140	10 P. M.
14	30.156	30.162	30.179	30.169	30.224	10 P. M.	30.151	0 A. M.
15	30.271	30.239	30.211	30.233	30.277	11 A. M.	30.209	12 P. M.
16	30.199	30.076	29.959	30.048	30.209	0 A. M.	29.826	12 P. M.
17	29.441	29.320	29.328	29.354	29.826	0 A. M.	29.310	3 P. M.
18	29.460	29.566	29.705	29.609	29.745	11 P. M.	29.417	0 A. M.
19	29.982	30.248	30.412	30.263	30.505	12 P. M.	29.748	0 A. M.
20	30.519	30.383	30.144	30.297	30.556	9 A. M.	30.012	12 P. M.
21	29.336	29.245	29.521	29.405	30.012	0 A. M.	29.253	8 A. M.
22	29.953	30.181	30.290	30.178	30.318	12 P. M.	29.652	0 A. M.
23	30.425	30.443	30.410	30.422	30.493	9 A. M.	30.318	0 A. M.
24	30.347	30.106	30.039	30.132	30.406	2 A. M.	30.039	5 P. M.
25	30.066	29.986	29.960	29.993	30.069	8 A. M.	29.971	12 P. M.
26	29.968	29.820	29.807	29.850	29.973	0 A. M.	29.755	11 P. M.
27	29.685	29.473	29.043	29.311	29.755	0 A. M.	28.943	12 P. M.
28	28.878	29.033	29.076	29.015	29.091	12 P. M.	28.883	3 A. M.
29	29.117	29.297	29.508	29.357	29.616	12 P. M.	29.091	0 A. M.
30	29.786	29.901	29.934	29.888	29.959	12 P. M.	29.628	0 A. M.
31	29.988	29.708	29.547	29.697	30.018	7 A. M.	29.525	12 P. M.

WIND.

	DIRECTION.			VELOCITY IN MILES FROM				FORCE IN POUNDS PER SQUARE FOOT.				
JAN.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	TOTAL	7 A. M.	2 P. M.	9 P. M.	MAXIMUM.	TIME.
1		N. W.	NW.	50	54	28	132					
2	S. SW.	SW.	SW.	32	36	12	80					
3	S.	SW.		10	30	77	117	¼	1¾	1¾	28-10	4.30 P. M.
4	NW.	E. NE.	SW.	61	20	4	85	0	0	0	½	10 A. M.
5	E. SE.			20	49	92	151	½	1	2¼	3½	7.45 P. M.
6	-	N.	N.	135	103	96	334	3	2	1½	5⅛	3 A. M.
7	N.	N.	N. NW.	111	105	55	271	2⅛	1½	1	3	3.30 P. M.
8	NW.	N. NW.	E. SE.	80	80	28	188	½	¾	0	5	12 M.
9	E. SE.	N.	S.	13	19	91	123	0	0	20½	26	7 P. M.
10	SW.	W. SW.	W. NW.	85	104	125	314	1	6	4½	12¾	1 P. M.
11	W.	W.	W. SW.	91	80	42	213	½	2¼	0	6¼	4.15 A. M.
12	W. NW.	W.	W. NW.	51	61	39	151	0	1¼	0	4	10 A. M.
13	E. SE.	S.	S.	14	13	36	63	0	1	0	1	2 P. M.
14	N.	N.	N. NE.	30	52	58	140	0	3	¼	3	2 P. M.
15	W.	S. SW.	S. SE.	41	11	28	80	½	¾	¾	¾	2 P. M.
16	S. SW.	S. SW.	SW.	29	19	77	125	¼	1	2	3½	4.30 P. M.
17	S. W.	S. SW.	W.	115	108	68	291	11½	3	1	16	6.15 A. M.
18	W. NW.	NW.	NW.	55	37	60	152	½	3	1	3	12 M.
19	N. NW.	NW.	NE.	105	125	103	333	0	6	4	9¼	3 P. M.
20	N. NE.	E. NE.	E. SE.	110	27	41	178	1¼	0	¾	6	4.30 A. M.
21	E. SE.	NW.	W. NW.	92	97	95	284	1½	5	5½	11½	1.15 P. M.
22	NW.	N. NW.	SE.	145	94	41	280	4	4¼	0	11	0 A. M.
23	E.		S. SE.	22	2	41	65	0	0	¾	1	10 P. M.
24	S. SW.	S.	S. SW.	70	24	50	144	0	0	½	2½	4.30 P. M.
25		SW.		22	5	8	35	0	1¼	0	1¼	2 P. M.
26		NW.	NW.	13	3	4	20	0	0	0	0	
27				6	34	95	135	0	2½	¼	5¾	5 P. M.
28	N. NW.	NE.	N.	31	82	27	140	0	⅜	1½	6¾	8.30 A. M.
29	S.	NW.	NW.	65	80	40	185	1¾	3½	1¼	6½	5.30 A. M.
30	N.	W.	S. SE.	80	22	36	138	0	1¼	0	3	0 A. M.
31	N.	S. SW.	S. SW.	31	31	92	154	0	3½	0	1¼	2.15 P. M.

THERMOMETER.

(IN THE SHADE.)

FAHRENHEIT DEGREES.

	7 A. M.		2 P. M.		9 P. M.		MEAN.		MAXIMUM.				MINIMUM.			
JAN.	DRY.	WET.	DRY.	WET.	DRY.	WET.	DRY.	WET.	DRY.	TIME.	WET.	TIME.	DRY.	TIME.	WET.	TIME.
1	35	33	36	33	30	29	33.6	31.6	36	2 P. M.	33	2 P. M.	30	9 P. M.	29	9 P. M.
2	34	32	37	34	34	33	35.0	33.0	37	2 P. M.	34	2 P. M.	34	7 A. M.	32	7 A. M.
3	36	34	43	39	35	33	38.0	35.3	43	2 P. M.	39	2 P. M.	35	9 P. M.	33	9 P. M.
4	33	32	49	46	35	34	39.0	37.3	49	2 P. M.	46	2 P. M.	33	7 A. M.	32	7 A. M.
5	34	33	40	38	37	35	37.0	35.3	40	2 P. M.	38	2 P. M.	34	7 A. M.	33	7 A. M.
6	36	35	36	36	36	35	36.0	35.3	36	7 A. M.	36	2 P. M.	36	7 A. M.	35	7 A. M.
7	36	36	40	38	36	34	37.3	36.0	40	2 P. M.	38	2 P. M.	36	7 A. M.	34	9 P. M.
8	38	36	44	41	35	34	39.0	37.0	44	2 P. M.	41	2 P. M.	35	9 P. M.	34	9 P. M.
9	34	32	37	36	56	54	42.3	40.6	56	9 P. M.	54	9 P. M.	34	7 A. M.	32	7 A. M.
10	40	35	42	35	37	32	37.6	37.3	42	2 P. M.	35	2 P. M.	37	9 P. M.	32	9 P. M.
11	32	30	38	32	37	33	35.6	31.6	38	2 P. M.	33	9 P. M.	32	7 A. M.	30	7 A. M.
12	30	27	34	33	30	29	31.3	29.6	34	2 P. M.	33	2 P. M.	30	7 A. M.	27	7 A. M.
13	23	22	39	38	36	32	32.6	30.6	39	2 P. M.	38	2 P. M.	23	7 A. M.	22	7 A. M.
14	32	29	36	31	27	26	31.6	28.6	36	2 P. M.	31	2 P. M.	27	9 P. M.	26	9 P. M.
15	16	15	36	35	31	28	27.6	26.0	36	2 P. M.	35	2 P. M.	16	7 A. M.	15	7 A. M.
16	29	28	42	37	43	40	38.0	35.0	43	9 P. M.	40	9 P. M.	29	7 A. M.	28	7 A. M.
17	56	52	58	35	51	49	55.0	52.0	58	2 P. M.	55	2 P. M.	51	9 P. M.	49	9 P. M.
18	36	32	41	34	35	28	37.3	31.3	41	2 P. M.	34	2 P. M.	35	9 P. M.	28	9 P. M.
19	24	21	20	16	13	11	19.0	16.0	24	7 A. M.	21	7 A. M.	13	9 P. M.	11	9 P. M.
20	8	5	21	17	24	23	17.6	15.0	24	9 P. M.	23	9 P. M.	8	7 A. M.	5	7 A. M.
21	34	31	34	30	26	21	31.3	27.3	34	7 A. M.	31	7 A. M.	26	9 P. M.	21	9 P. M.
22	20	17	28	23	26	22	24.6	20.6	28	2 P. M.	23	2 P. M.	20	7 A. M.	17	7 A. M.
23	6	5	28	28	33	29	22.3	20.6	33	9 P. M.	29	9 P. M.	6	7 A. M.	5	7 A. M.
24	24	24	41	39	36	36	33.6	33.0	41	2 P. M.	39	2 P. M.	24	7 A. M.	24	7 A. M.
25	24	24	38	36	28	28	30.0	29.3	38	2 P. M.	36	2 P. M.	24	7 A. M.	24	7 A. M.
26	18	18	39	37	32	31	29.6	28.6	39	2 P. M.	37	2 P. M.	18	7 A. M.	18	7 A. M.
27	33	33	34	34	32	32	33.	33.	34	2 P. M.	34	2 P. M.	32	9 P. M.	32	9 P. M.
28	33	33	37	35	30	30	33.3	32.6	37	2 P. M.	35	2 P. M.	30	9 P. M.	30	9 P. M.
29	21	20	23	21	13	12	19	17.6	23	2 P. M.	21	2 P. M.	13	9 P. M.	12	9 P. M.
30	15	14	28	26	22	21	21.6	30.3	28	2 P. M.	26	2 P. M.	15	7 A. M.	14	7 A. M.
31	18	18	45	41	40	38	34.3	32.3	45	2 P. M.	41	2 P. M.	18	7 A. M.	18	7 A. M.

HYGROMETER.

	Dewpoint.			Force of Vapor.				Weight of Vapor in a cu. ft. of Air.			Relative Humidity.			
Jan.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	30.0	28.5	25.9	0.186	0 176	0.160	0.174	2.19	2.07	1.91	0.836	0.764	0.864	0.821
2	28.8	29.5	31.4	0.178	0.182	0.195	0.185	2.11	2.14	2.31	0.834	0.764	0.913	0.837
3	31.0	34.2	30.0	0.192	0.216	0.186	0.198	2.27	2.51	2.19	0.838	0.736	0.836	0.803
4	30.2	42.7	32.5	0.187	0.290	0.203	0.226	2.22	3.34	2.40	0.906	0.807	0.916	0.876
5	31.4	35.6	32.0	0.195	0.227	0.199	0.207	2.31	2.65	2.35	0.913	0.858	0.839	0.879
6	33.5	36.0	33.5	0.210	0.230	0.210	0.206	2.48	2.71	2.48	0.915	1.000	0 915	0.943
7	36.0	35.6	31.0	0.230	0.227	0.192	0.216	2.71	2.65	2.27	1.000	0.858	0.838	0.898
8	33.0	37.4	32.5	0.207	0.241	0.203	0.217	2.43	2.80	2.40	0.841	0.796	0.916	0.851
9	28.8	34.5	52.6	0.178	0.218	0.408	0.268	2.11	2.56	4.61	0.834	0.914	0.890	0.879
10	29.0	26.6	24.5	0.179	0.164	0.152	0.165	2.09	1.91	1.79	0.676	0.579	0.640	0.631
11	25.8	23.0	27.0	0.160	0.144	0.167	0.157	1.90	1.70	1.96	0.802	0.588	0.700	0.696
12	17.6	31.4	25.9	0.118	0.195	0.160	0.157	1.42	2.31	1.91	0.643	0.913	0.864	0.806
13	14.5	36.5	26.0	0.106	0.234	0.161	0.167	1.28	2.74	1.89	0.731	0.917	0.698	0 782
14	23.3	23.5	21.5	0.146	0.147	0.137	0.143	1.74	1.74	1.64	0.735	0.642	0.820	0.732
15	7.5	33.5	21.2	0.081	0.210	0.135	0.142	1.00	2.48	1.60	0.730	0.915	0.699	0.781
16	24.5	31.0	36.4	0.152	0.192	0.233	0.192	1.82	2.24	2.71	0.851	0.679	0.795	0.775
17	49.2	52.9	47.0	0.363	0.412	0.337	0.370	4.11	4.64	3.85	0.793	0.842	0.871	0.835
18	26.0	25.6	17.5	0.161	0.158	0.117	0.145	1.89	1.85	1.39	0.698	0.580	0.531	0.603
19	13.0	1.	3.	0.129	0.196	0.081	0.102	0.95	0.56	0.62	0.620	0.440	0.640	0.566
20	-13.	3.	16.7	0.064	0.114	0.115	0.097		0.62	1.38	0.360	0.450	0.762	0.524
21	26.2	23.6	6.	0.162	0.147	0.140	0.149	1.91	1.75	0.70	0.755	0.692	0.420	0.622
22	7.	9.	11.	0.109	0.153	0.140	0.134	0.73	0.80	0.87	0.580	0.450	0.530	0.520
23	-7.0	28.0	21.8	0.074	0.173	0.138	0.128		2.07	1.65	0.430	1.000	0.674	0.701
24	24.0	36.6	36.0	0.150	0.235	0.230	0.205	1.81	2.74	2.71	1.000	0.859	1.000	0.953
25	24.0	33.0	28.0	0.150	0.207	0.173	0.176	1.81	2.43	2.07	1.000	0.841	1.000	0.947
26	18.0	34.0	29.5	0.120	0.214	0.182	0.172	1.47	2.51	2.17	1.000	0.840	0.916	0.918
27	31.	32.	30,	0.187	0.194	0.179	0.186	2.046	2.126	1.969	0.950	0.950	0.950	0.950
28	31.	32.	28.	0.187	0.219	0.165	0.190	2.046	2.126	1.817	0.950	0.820	0.950	0.906
29	18.	16.	9.	0.114	0.124	0.081	0.106	1.190	1.090	0.806	0.860	0.740	0.820	0.806
30	11.	22.	19.	0.088	0.153	0.119	0.120	0.878	1.415	1.243	0.830	0.780	0 860	0.823
31	17.	36.	35.	0.100	0.298	0.246	0.213	1.138	2.469	2.379	0.970	0.710	0.840	0.840

CLOUDS. RAIN AND SNOW.

Day.	Clear—0. Overcast—10.			Depth in inches.				
	7 A.M.	2 P.M.	9 P.M.	Beginn'g	Ending.	Duration.	Water.	Snow.
1	0	0	0					
2	7	7	7					
3	10	2	0					
4	6	6	5					
5	8	10	10					
6	10	10	10	5.30 A.M.				
7	10	10	8		3 P.M.	19½	.40	
8	2	2	8					
9	10	10	10	10 A.M.				
10	7	5	8		6 A.M.	20	.70	
11	2	2	10					
12	1	1	0					
13	1	2	9					
14	9	1	0					
15	0	0	1					
16	10	10	10	6 P.M.				
17	10	10	7		3 P.M.	21	.30	
18	0	4	7					
19	1	0	0					
20	3	10	10	8 P.M.				
21	10	8	9		10.30 A.M.	14½	.30	5½
22	1	0	1					
23	1	0	0					
24	0	10	0					
25	0	0	0					
26	10	10	10					
27	10	10	10					¾
28	10	8	10	9 P.M.				¼
29	10	2	0					
30	10	8	0					
31	10	9	10	9.45 P.M.				

HOURLY READINGS FROM THE

DRAPER SELF-RECORDING THERMOMETER.

IN THE SHADE.

FAHRENHEIT DEGREES.

Jan.	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Mean.
1	40	40	40	38	37	36	35	34	36	37	38	39	39	39	38	37	36	35	34	34	34	33	32	39	36.6
2	39	39	39	39	39	39	39	39	39	39	39	39	39	45	39	39	38	37	37	37	38	38	38	38	38.8
3	37	37	37	37	36	36	36	37	37	38	39	40	41	46	46	43	41	39	38	38	37	36	35	35	38.4
4	35	35	35	34	34	34	34	35	35	37	39	42	45	46	47	47	46	46	44	41	40	38	38	37	39.3
5	36	35	35	35	35	35	35	34	35	37	38	38	40	40	40	40	40	39	39	38	38	37	36	36	37.1
6	35	35	35	35	35	35	35	35	35	36	36	36	36	36	36	36	36	37	37	37	37	37	37	36	35.8
7	36	36	36	36	36	36	36	37	37	37	38	39	40	40	40	40	40	40	40	39	39	39	39	39	38.1
8	39	39	39	39	39	39	39	38	40	40	41	45	42	47	44	44	42	40	39	38	38	37	36	34	39.9
9	34	33	33	33	33	33	33	33	34	34	35	35	35	35	36	40	41	45	55	55	56	50	46	46	39.3
10	43	43	41	41	40	40	39	39	40	41	41	41	40	40	40	39	37	36	36	35	35	35	34	34	38.7
11	34	34	34	33	33	33	32	31	33	33	35	35	35	36	37	36	34	34	33	33	35	35	35	35	34.0
12	33	32	32	31	30	29	29	29	32	34	33	33	34	34	34	33	33	31	31	30	30	30	29	28	31.6
13	28	27	27	26	26	25	25	24	26	28	31	32	35	37	39	40	39	38	38	37	36	36	34	34	32.0
14	32	32	32	30	30	30	31	31	31	32	32	33	35	35	36	36	35	34	32	30	29	27	26	24	31.5
15	23	22	21	20	19	18	17	19	20	23	26	29	32	36	37	38	37	35	34	33	32	32	30	29	27.5
16	29	29	29	29	29	29	29	30	31	33	35	37	38	41	42	42	42	42	41	40	40	40	40	41	35.7
17	41	41	42	45	49	51	51	51	53	53	54	55	55	55	55	55	54	52	52	51	48	44	42	42	49.6
18	41	39	38	38	37	36	36	37	40	40	40	41	41	40	40	38	37	36	35	34	34	34	34	33	37.4
19	32	31	31	30	24	24	24	24	24	25	23	22	22	22	20	20	18	17	16	15	14	14	13	12	21.5
20	12	11	10	9	9	8	8	8	9	11	14	17	19	20	21	24	24	24	24	24	28	25	24	24	16.9
21	25	27	28	29	30	31	31	31	31	31	32	37	35	34	34	32	30	29	28	28	28	27	26	24	29.9
22	23	22	21	21	21	20	20	20	21	23	25	27	27	28	28	28	25	25	25	25	25	25	23	22	23.7
23	22	22	21	18	16	15	13	12	11	13	15	18	23	28	31	32	32	32	32	32	32	32	31	31	23.5
24	30	30	29	26	26	26	26	30	27	27	32	35	40	41	41	40	40	40	40	40	40	40	38	38	34.2
25	38	36	35	34	31	31	30	29	29	31	33	37	38	41	42	42	41	40	39	38	36	35	35	33	35.6
26	31	28	27	25	24	22	22	21	24	25	27	31	34	36	38	38	38	38	39	38	37	35	34	34	31.0
27	34	34	34	34	34	34	34	35	35	35	35	35	35	35	35	35	35	34	33	32	31	31	31	31	33.7
28	31	31	31	31	31	32	33	33	37	36	36	35	35	35	35	35	34	34	34	34	34	33	33	32	33.5
29	32	30	28	26	26	26	23	22	21	21	21	21	23	23	22	21	21	20	19	18	18	17	16	15	22.0
30	14	14	14	14	14	15	16	17	18	21	24	26	29	28	28	29	29	29	28	27	27	27	26	25	22.4
31	23	21	21	19	19	18	18	19	23	25	28	30	41	44	44	44	44	43	43	41	41	40	39	38	31.9

REMARKS.

Day.	7 A. M.	2 P. M.	9 P. M.
1	clear—pleasant.	clear—pleasant.	clear—pleasant.
2	overcast—mild.	overcast—mild.	overcast—mild.
3	overcast—mild.	clear—mild.	clear—pleasant.
4	fair—mild.	fair—mild.	fair—mild.
5	overcast—mild.	overcast—mild.	overcast—mild.
6	overcast—raining.	overcast—raining.	overcast—raining.
7	overcast—raining.	overcast.	cloudy—mild.
8	fair—mild.	fair—mild.	fair—mild.
9	overcast—mild.	overcast—raining.	overcast—mild.
10	cloudy—mild.	fair—mild.	cloudy—mild.
11	cool—pleasant.	cool wind.	clear—pleasant.
12	cool—pleasant.	cool wind.	clear—pleasant.
13	cool—pleasant.	mild—pleasant.	cloudy—mild.
14	cloudy—cool.	fair—mild.	clear—cool.
15	cold—pleasant.	clear—pleasant.	fair—cool.
16	overcast—raw.	overcast—raw.	overcast—rainy.
17	overcast—mild—windy.	overcast—mild wind.	overcast—mild wind.
18	clear—calm.	fair—mild wind.	mild wind.
19	clear—cool wind.	clear—cold wind.	clear—cold wind.
20	cold—calm.	overcast—cool.	overcast—snowing.
21	overcast—rain and snow	cloudy—cool.	high wind—cool.
22	fair—cold wind.	clear—cool wind.	fair—calm.
23	cold—smoky.	clear—calm.	clear—calm.
24	mild—foggy.	overcast—mild.	clear—mild.
25	clear—calm.	clear—calm—mild.	clear—calm.
26	overcast—calm.	overcast—calm.	overcast—calm.
27	overcast—rain and hail.	overcast—snow.	overcast—fine rain.
28	overcast—calm.	cloudy—calm	overcast—snow.
29	overcast—cold wind.	fair—cold wind.	clear—cold wind.
30	overcast—calm.	cloudy—cold wind.	clear—cold wind.
31	overcast—calm.	cloudy—mild.	overcast—calm.

200121
Rec'd

BULLETIN No. 2. FEBRUARY, 1889.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instrumemts above ground, 51 ft. Above sea level, 260 ft.

Pressure. In inches. Mean reduced to 32° F., 29.918; Monthly Range, 1.537.

Air Temperature. In Degrees Fahrenheit. Mean, 23.9°; Highest, 47.0°; Lowest, —2.8°; Monthly Range, 49.8°; Highest Mean Daily, 40.3°; Lowest Mean Daily, 7.3°; Mean Maximum, 28.7°; Mean Minimum, 17.1°; Mean Daily Range, 15.5°; Greatest Daily Range, 30.0°.

Humidity. Mean Dew Point, 21.2; Mean Relative Humidity, 90.

Wind. Prevailing Direction, North; Total Movement, 4828 miles; Greatest Daily Movement, 570 2-23 miles; Least Daily Movement, 41.4 miles; Mean Daily Movement, 172.4 miles, Mean Hourly Velocity, 7.2 miles; Maximum Pressure per Square Foot, 24 lbs.

Precipitation. In inches. Total Precipitation, 1.22; Total Depth of Snow, 7 1-4; Depth of unmelted Snow on Ground at end of month, 3.

Bright Sunshine. Number of Hours Recorded, 183; Maximum Temperature in Fahrenheit Degrees, 117°.

Weather. Mean Cloudiness, on a Scale of 10, 4; Number of Clear Days, 6; Number of Cloudy Days, 4.

HOURLY READINGS FROM THE
DRAPER SELF-RECORDING THERMOMETER.
IN THE SHADE.
FAHRENHEIT DEGREES.

Feb.	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Mean.
1	36	36	35	34	34	33	29	28	28	27	27	26	26	26	25	24	23	20	20	19	19	19	19	18	26.2
2	18	18	18	18	20	19	19	20	24	25	26	29	31	33	35	36	36	35	35	35	34	33	33	31	27.6
3	31	31	31	31	31	31	31	31	32	34	36	39	40	41	33	32	30	24	23	22	20	17	15	13	29.1
4	11	9	3	3	0	−2	−2	2	7	8	10	11	17	20	21	24	26	27	24	24	24	24	24	24	14.2
5	24	24	24	24	24	24	25	27	29	30	32	33	33	34	34	33	34	35	35	35	34	35	35	35	30.5
6	35	35	34	24	21	19	17	16	15	15	14	12	11	11	11	10	9	9	8	8	8	8	8	8	15.1
7	7	7	7	6	6	8	8	13	16	16	15	17	16	18	19	18	18	17	17	17	18	18	17	17	14.0
8	16	16	16	16	16	17	17	18	18	20	23	25	27	27	28	28	28	28	28	27	27	27	27	27	22.7
9	27	26	26	25	24	24	24	24	24	26	27	31	32	33	33	34	33	33	32	32	31	30	29	29	28.7
10	29	29	28	27	27	27	26	26	26	27	27	29	30	31	31	31	31	31	30	30	27	26	24	22	28.0
11	18	17	15	14	13	12	11	11	14	16	20	25	27	29	29	30	30	30	30	30	29	29	29	28	22.3
12	27	27	27	27	27	27	27	27	27	30	30	30	30	30	29	26	24	22	20	19	19	19	18	17	25.2
13	17	16	15	14	13	11	8	8	8	9	11	14	14	14	14	14	13	12	11	11	11	10	10	11	12.0
14	12	13	14	15	15	17	18	18	20	21	22	23	24	25	25	24	24	24	24	23	23	22	22	21	20.4
15	21	21	20	19	19	20	20	20	24	29	29	29	30	32	33	33	33	31	30	28	26	25	24	23	25.8
16	22	20	19	18	17	15	13	19	23	25	33	37	37	38	38	39	43	40	39	37	37	37	37	35	29.9
17	35	35	35	35	35	35	35	35	36	40	42	44	44	47	47	47	45	44	44	43	42	41	41	41	40.3
18	41	40	39	38	37	37	38	39	39	36	37	39	39	39	39	38	38	37	37	37	37	37	37	38	38.0
19	38	38	37	35	35	34	31	31	30	30	31	30	28	28	27	27	26	25	24	24	24	24	24	24	29.3
20	23	23	22	22	21	21	22	22	22	23	25	25	26	26	26	26	25	23	22	21	20	20	20	19	22.7
21	19	18	17	17	15	15	15	16	20	23	23	27	28	29	30	31	31	30	29	29	28	28	28	28	23.9
22	28	28	28	29	29	29	29	30	32	33	37	39	40	39	40	41	39	37	36	35	34	32	28	26	33.2
23	24	22	18	15	11	8	5	3	3	5	6	6	6	7	7	6	5	4	3	2	2	2	2	2	7.3
24	1	1	0	0	0	−1	−2	0	3	3	7	10	11	13	16	16	17	17	16	15	15	15	15	15	8.4
25	15	14	14	12	12	12	12	12	13	14	16	18	20	21	22	23	23	22	20	18	17	16	15	13	16.4
26	12	10	9	8	8	7	5	6	10	12	15	17	22	25	27	27	27	26	24	24	24	24	25	25	17.4
27	24	23	23	23	23	23	23	23	24	26	30	31	32	33	33	34	34	34	33	32	32	32	32	31	28.6
28	31	30	29	28	28	28	28	28	29	30	32	33	35	35	36	37	37	36	35	34	34	33	31	29	31.9
29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
31	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

BAROMETER.

REDUCED TO FREEZING.

Feb.	7 A. M.	2 P. M.	9 P. M.	Mean.	Maximum.	Time.	Minimum.	Time.
1	29.509	29.629	29.755	29.631	29.742	4 P. M.	29.490	1 A. M.
2	29.663	29.535	29.525	29.574	29.742	0 A. M.	29.531	12 P. M.
3	29.523	29.468	29.663	29.551	29.711	12 P. M.	29.531	0 A. M.
4	29.640	29.858	29.802	29.766	30.885	10 A. M.	29.711	0 A. M.
5	29.699	30.385	29.295	29.459	30.802	0 A. M.	29.273	12 P. M.
6	29.170	29.346	29.494	29.336	29.524	12 P. M.	29.150	5 A. M.
7	29.544	29.588	29.798	29.643	29.831	12 P. M.	29.501	0 A. M.
8	29.971	29.901	29.901	29.924	29.998	8 A. M.	29.831	0 A. M.
9	29.762	29.715	29.796	29.957	29.874	0 A. M.	29.715	2 P. M.
10	29.857	29.899	29.934	29.896	29.948	12 P. M.	29.799	0 A. M.
11	29.967	29.709	29.609	29.785	29.967	7 A. M.	29.579	12 P. M.
12	29.504	29.416	29.475	29.798	29.581	0 A. M.	29.416	12 P. M.
13	29.504	29.441	29.496	29.480	29.504	7 A. M.	29.438	1 P. M.
14	29.564	29.649	29.795	29.669	29.908	12 P. M.	29.499	0 A. M.
15	30.074	30.071	30.134	30.093	30.175	12 P. M.	29.908	0 A. M.
16	30.252	30.094	29.927	30.091	30.255	9 A. M.	29.812	12 P. M.
17	29.632	29.511	29.564	29.569	29.812	0 A. M.	29.488	3 P. M.
18	29.575	29.272	29.188	29.345	29.564	0 A. M.	29.188	9 P. M.
19	29.438	29.674	29.842	29.651	29.895	12 P. M.	29.188	0 A. M.
20	30.068	30.164	30.283	30.171	30.326	12 P. M.	29.905	0 A. M.
21	30.420	30.449	30.421	30.430	30.454	12 P. M.	30.326	0 A. M.
22	30.259	30.232	29.825	30.105	29.401	0 A. M.	29.820	7 P. M.
23	30.425	30.265	30.443	30.280	30.473	12 P. M.	29.869	0 A. M.
24	30.643	30.617	30.597	30.619	30.649	11 A. M.	30.473	0 A. M.
25	30.565	30.511	30.512	30.529	30.577	0 A. M.	30.485	4 P. M.
26	30.665	20.660	30.652	30.659	30.687	11 A. M.	30.573	0 A. M.
27	30.615	30.488	30.430	30.511	30.640	0 A. M.	30.433	12 P. M.
28	30.441	30.372	30.335	30.382	30.441	7 A. M.	30.327	5 P. M.

Sun Thermometer.

Fahrenheit degrees.

Feb.	Maximum sun.	TIME.	Possible hours of sunshine.	Actual hours of sunshine.
1				
2	79	12 m.	10	5
3	90	10-30 a.m.	10	7
4	81	1-30 p.m.	10	9
5	73	12-30 m.	10	6
6	81	12 m.	10	5
7	58	12 m.	10	4
8	89	12-30 m.	10	3
9	114	1 p.m.	10	2
10	110	1 p.m.	10	8
11	80	12 m.	10	10
12	101	1 p.m.	10	9
13	77	11-45 a.m.	10	7
14	95	12-30 m.	10	7
15	117	1-30 p.m.	10	10
16	117	1 p.m.	10	9
17	117	1-30 p.m.	10	7
18	52	12 m.	10	
19	98	1 p.m.	10	8
20	104	2 p.m.	10	9
31	114	2 p.m.	10	10
22	112	12-15 m.	10	9
23	75	1 p.m.	10	5
24	101	1 p.m.	11	9
25	102	1 p.m.	11	10
26	112	1 p.m.	11	8
27	67	1 p.m.	11	0
28	116	1 p.m.	11	7

WIND.

Feb.	DIRECTION.			MOVEMENT IN MILES FROM				FORCE IN POUNDS PER SQUARE FOOT.				
	7 A. M.	2 P. M.	9 P. M.	9 P. M. to 7 A. M.	7 A. M. to 2 P. M.	2 P. M. to 9 P. M.	TOTAL	7 A. M.	2 P. M.	9 P. M.	MAXIMUM.	TIME.
1	N. NW.	N. NW.	N. NW.	56	85	74	215	4¾	3	0	5½	3 P. M.
2	SW.	SW.	SW.	45	36	42	123	0	1½	0	2¼	7 P. M.
3	SE.	N.	N. NE.	45	61	84	190	0	5	3¼	9	1.30 P. M.
4	N.	S.		63	10	7	80	0	0	0	3½	1.30 A. M.
5		N. NW.		9	13	19	41	0	0	0	0	
6	N.	W.	W.	35	104	106	245	1	6½	17¾	17¾	9 P. M.
7	S. W.	W. NW.	W. NW.	184	90	160	434	1¼	20½	10	24	3 P. M.
8	S. SE.	S.	SE.	35	65	51	151	1	2¼	0	3½	3 P. M.
9	NE.	N. W.	W. SW.	29	13	19	61	0	0	0	½	5 P. M.
10	W. NW.	N. NW.		53	65	25	143	1¼	0	0	2¼	9 A. M.
11		N.	N.	11	14	20	45	0	0	0	0	
12		N. NW.	N. NW.	27	33	57	117	0	1¼	0	3¼	4.30 A. M.
13	W. NW.	NW.	NW.	58	97	91	246	½	9¾	2¼	11	1.30 P. M.
14		NW.	NW.	70	69	80	219	0	3	1¼	6½	4.30 P. M.
15	N.	N.	N.	57	43	59	159	½	½	0	2½	3 P. M.
16		E. SE.	E. SE.	25	30	34	89	0	0	0	1¼	4.30 P. M.
17	N. NW.	S.		54	17	35	106	0	¼	0	2½	6.30 P. M.
18	N. NE.	E.		35	52	35	122	¼	3	0	3	2 P. M.
19	W. NW.	W. NW.	W. SW.	109	120	68	297	7½	3	0	15¾	8.30 A. M.
20	W.	W. NW.	W. NW.	122	80	70	272	2	2	¾	4½	10.45 A.M.
21	S.	S. SW.	S. SE.	42	32	84	158	0	1	2½	2½	9 P. M.
22	SW.	SW.	SW.	108	160	168	436	3	3¾	3	6¾	11.30 P. M.
23	E.	N. NW.	NW.	273	171	126	570	4½	3½	1½	6¼	4 P. M.
24	E. SE.	S.	S.	24	8	27	59	0	0	0	0	
25	N.	N.	N.	32	26	40	98	0	½	½	1	1 P. M.
26	NE.	NE.	NE.	37	17	11	65	0	0	0	0	
27	N. NE.	S. SE.	S. SE.	4	31	9	44	0	0	0	1	11.30 A.M.
28	NE.	N.	NE.	11	13	19	43	0	0	0	0	

HYGROMETER.

Feb.	Dewpoint.			Force of Vapor.				Weight of Vapor in a cu. ft. of Air.			Relative Humidity.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	26.0	16.0	15.0	.1593	.1409	.1051	.1351	1.674	1.090	1.043	89	65	85	80
2	18.0	28.0	32.0	.1051	.1872	.1948	.1623	1.190	1.817	2.126	97	80	95	91
3	29.0	40.0	19.0	.1728	.2562	.1096	.1795	1.892	2.862	1.243	95	96	97	93
4	-3.0	16.0	22.0	.0409	.1096	.1297	.0934		1.090	1.415	94	86	94	91
5	23.0	32.0	32.0	.1352	.1948	.1948	.1749	1.476	2.126	2.126	94	95	95	95
6	16.0	10.0	3.0	.0965	.0742	.0649	.0785	1.090	0.841	0.624	97	96	79	91
7	7.0	10.0	17.0	.0649	.1007	.1007	.0887	0.739	0.841	1.138	96	70	97	88
8	16.0	24.0	25.0	.0965	.1469	.1469	.1634	1.090	1.540	1.606	97	89	94	93
9	22.0	28.0	29.0	.1297	.1872	.1728	.1632	1.415	1.817	1.892	94	80	95	90
10	24.0	28.0	24.0	.1409	.1593	.1469	.1490	1.540	1.817	1.540	94	90	89	91
11	10.0	27.0	27.0	.0742	.1593	.1593	.1309	0.841	1.745	1.745	96	95	95	95
12	25.0	28.0	15.0	.1469	.1659	.1051	.1393	1.606	1.817	1.043	94	95	85	91
13	7.0	13.0	6.0	.0649	.0847	.0742	.0746	0.739	0.957	0.708	96	96	81	91
14	17.0	23.0	20.0	.1007	.1352	.1244	.1201	1.138	1.476	1.298	97	94	87	93
15	18.0	30.0	20.0	.0885	.1799	.1409	.1364	1.190	1.969	1.298	93	95	76	88
16	9.0	33.0	36.0	.0811	.2280	.2193	.1761	0.806	2.208	2.469	82	83	96	87
17	33.0	46.0	41.0	.2027	.3218	.2662	.2602	2.208	35.50	2.967	95	96	96	96
18	36.0	37.0	36.0	.2280	.2371	.2193	.2281	2.469	2.563	2.469	92	92	96	93
19	28.0	22.0	21.0	.1728	.1530	.1297	.1518	1.817	1.415	1.355	90	78	87	85
20	19.0	23.0	16.0	.1193	.1409	.1096	.1232	1.243	1.476	1.090	86	88	86	87
21	14.0	26.0	25.0	.0885	.1593	.1530	.1336	0.999	1.674	1.606	97	89	89	92
22	27.0	32.0	29.0	.1293	.2371	.1048	.1970	1.745	2.126	1.892	95	75	81	84
23	-1.0	1.0	-5.0	.0567	.0620	.0493	.0560		0.569		76	78	73	76
24	-3.0	12.0	14.0	.0409	.0811	.0885	.0701		0.916	0.999	94	96	97	96
25	11.0	19.0	16.0	.0776	.1144	.0965	.0961	0.878	1.243	1.090	96	93	97	95
26	4.0	23.0	22.0	.0567	.1352	.1297	.1072	0.649	1.476	1.415	95	94	94	94
27	21.0	31.0	30.0	.1244	.1872	.1799	.1638	1.355	2.046	1.969	93	95	95	94
28	22.0	27.0	31.0	.1530	.2027	.1948	.1835	1.415	1.745	2.046	72	72	90	80

THERMOMETER.

(IN THE SHADE.)

FAHRENHEIT DEGREES.

FEB.	7 A. M.		2 P. M.		9 P. M.		MEAN.		MAXIMUM.				MINIMUM.			
	DRY.	WET.	DRY.	WET.	DRY.	WET.	DRY.	WET.	DRY.	TIME.	WET.	TIME.	DRY.	TIME.	WET.	TIME.
1	29	28	26	23	19	18	24.6	23.0	29	7 A. M.	28	7 A. M.	19	9 P. M.	18	9 P. M.
2	19	19	33	31	34	34	28.6	28.0	34	9 P. M.	34	9 P. M.	19	7 A. M.	19	7 A. M.
3	31	31	41	41	20	20	30.6	30.6	41	2 P. M.	41	2 P. M.	20	9 P. M.	20	9 P. M.
4	-2	-2	20	19	24	24	14.0	13.6	24	9 P. M.	24	9 P. M.	-2	7 A. M.	-2	7 A. M.
5	25	25	34	34	34	34	31.0	31.0	34	9 P. M.	34	9 P. M.	25	7 A. M.	25	7 A. M.
6	17	17	11	11	8	7	12.0	11.6	17	7 A. M.	17	7 A. M.	8	9 P. M.	7	9 P. M.
7	8	8	18	16	18	18	14.6	14.0	18	9 P. M.	18	9 P. M.	8	7 A. M.	8	7 A. M.
8	17	17	27	26	27	27	23.6	23.3	27	9 P. M.	27	9 P. M.	17	7 A. M.	17	7 A. M.
9	24	24	33	31	31	31	29.3	28.6	33	2 P. M.	31	2 P. M.	24	7 A. M.	24	7 A. M.
10	26	26	31	29	27	26	28.0	27.0	31	2 P. M.	29	2 P. M.	26	7 A. M.	26	7 A. M.
11	11	11	29	29	29	29	23.0	23.0	29	2 P. M.	29	2 P. M.	11	7 A. M.	11	7 A. M.
12	27	27	30	30	19	18	25.3	25.0	30	2 P. M.	30	2 P. M.	19	9 P. M.	18	9 P. M.
13	8	8	14	14	11	10	11.0	10.6	14	2 P. M.	14	2 P. M.	8	7 A. M.	8	7 A. M.
14	18	18	25	25	23	22	22.0	21.6	25	2 P. M.	25	2 P. M.	18	7 A. M.	18	7 A. M.
15	20	20	32	32	26	24	26.0	25.3	32	2 P. M.	32	2 P. M.	20	7 A. M.	20	7 A. M.
16	13	12	38	36	37	37	29.3	28.3	38	2 P. M.	37	9 P. M.	13	7 A. M.	12	7 A. M.
17	35	35	47	47	42	42	41.3	41.3	47	2 P. M.	47	2 P. M.	35	7 A. M.	35	7 A. M.
18	38	37	39	38	37	37	38.0	37.3	39	2 P. M.	38	2 P. M.	37	9 P. M.	37	9 P. M.
19	31	29	28	26	24	23	27.6	26.0	31	7 A. M.	29	7 A. M.	24	9 P. M.	23	9 P. M.
20	22	21	26	25	20	19	22.6	21.6	26	2 P. M.	25	2 P. M.	20	9 P. M.	19	9 P. M.
21	15	15	29	28	28	27	24.0	23.3	29	2 P. M.	28	2 P. M.	15	7 A. M.	15	7 A. M.
22	29	29	39	36	34	32	34.0	32.3	39	2 P. M.	36	2 P. M.	29	7 A. M.	29	7 A. M.
23	5	4	7	6	2	1	4.6	3.6	7	2 P. M.	6	2 P. M.	2	9 P. M.	1	9 P. M.
24	-2	-2	13	13	15	15	8.6	8.6	15	9 P. M.	15	9 P. M.	-2	7 A. M.	-2	7 A. M.
25	12	12	21	21	17	17	16.6	16.6	21	2 P. M.	21	2 P. M.	12	7 A. M.	12	7 A. M.
26	5	5	25	25	24	24	18.0	18.0	25	2 P. M.	25	9 P. M.	5	7 A. M.	5	7 A. M.
27	23	23	33	33	32	32	29.3	29.3	33	2 P. M.	33	2 P. M.	23	7 A. M.	23	7 A. M.
28	28	26	35	32	34	33	32.3	32.3	35	2 P. M.	33	9 P. M.	28	7 A. M.	26	7 A. M.

CLOUDS. RAIN AND SNOW.

Day.	Clear—0. Overcast—10.			Depth in inches.				
	7 A.M.	2 P.M.	9 P.M.	Beginn'g	Ending.	Duration.	Water.	Snow.
1	9	0	2					
2	9	8	8	10.30 A.M.				
3	9	9	0					
4	0	6	10	late night				
5	10	10	10	3.30 P.M.				
6	10	3	2		8 A.M.	16½	.07	¾
7	4	5	1	2 P.M.				
8	2	10	10		8 A.M.	18	.04	½
9	10	10	0					
10	0	7	0					
11	0	10	10	9 P.M.	late night		.08	3
12	8	3	3					
13	1	5	1					
14	0	0	0					
15	2	1	0					
16	1	9	10	5.30 P.M.				
17	10	9	1		3 A.M.	9½	.40	
18	10	10	10	8.15 A.M.	9 A.M	12¾	.50	1
19	3	1	1					
20	7	1	0					
21	1	3	0					
22	10	1	10					
23	1	1	0					
24	0	0	0					
25	9	0	0					
26	0	10	10	11 P.M.				
27	10	10	10		9 P.M.	22	.13	2½
28	9	9	0					
.	.	.	.				1.22	7¼
.	.	.	.					
.	.	.	.					

REMARKS.

Day.	7 A. M.	2 P. M.	9 P. M.
1	cloudy—cold.	clear—cold.	clear—cold.
2	cloudy—cold.	cloudy—cold	cloudy—cold.
3	cloudy—cold.	cloudy—snow-squail.	clear—cold.
4	clear—very cold.	fair—cold.	overcast—cold.
5	overcast—cold.	overcast—mild.	overcast—mild.
6	overcast—cold.	clear—cold.	clear—cold.
7	fair—cold.	fair—cold.	clear—cold.
8	clear—cold.	overcast—cold.	overcast—cold.
9	overcast—cold.	overcast—mild.	clear—cold.
10	clear—cold.	clear—cold.	clear—cold.
11	clear—cold.	overcast—cold.	overcast—cold.
12	cloudy—cold.	clear—mild.	clear—cold.
13	clear—cold.	fair—cold.	clear—cold.
14	clear—cold.	clear—cold.	clear—cold.
15	clear—cold.	clear—mild.	clear—cold.
16	clear—cold.	cloudy—mild.	overcast—mild—raining.
17	overcast—cold wet.	fair—mild.	clear—mild.
18	overcast—mild.	overcast—mild—raining.	overcast—snow and rain
19	clear—cold	clear—cold.	clear—cold.
20	fair—cold.	clear—cold.	clear—cold.
21	clear—cold.	clear—cold.	clear—cold.
22	overcast—cold.	clear—mild	overcast—cold.
23	clear—cold.	clear—cold.	clear—cold.
24	clear—very cold.	clear—cold.	clear—cold.
25	cloudy—cold.	clear—cold.	clear—cold.
26	clear—cold.	clear—cold.	overcast—cold.
27	overcast—cold, snowing.	overcast—mild—snow'g.	overcast—mild—snow'g.
28	cloudy—cold.	cloudy—mild.	clear—mild.
29	. . . .	. . . .	. . . .
30	. . . .	. . . .	. . . .
31	. . . .	. . . .	. . . .

C. D. WARNER.

BULLETIN No. 3. MARCH, 1889.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instrumemts above ground, 51 ft. Above sea level, 260 ft.

Pressure. In inches. Actual maximum reading 30.340; Mean reduced to 32° F., 29.533; Monthly Range, 1.607.

Air Temperature. In Degrees Fahrenheit. Mean, 37.9°; Highest, 61.0°; Lowest, 23.0°; Monthly Range, 38.0°; Highest Mean Daily, 51.3°; Lowest Mean Daily, 29.2°; Mean Maximum, 43.4°; Mean Minimum, 32.3°; Mean Daily Range, 15.5°; Greatest Daily Range, 30.0°.

Humidity. Mean Dew Point, 30.4; Mean Relative Humidity, 75.0.

Wind. Prevailing Direction, N. E.; Total Movement, 7068 miles; Greatest Daily Movement, 520 miles, 21st; Least Daily Movement, 13 miles, 2d; Mean Daily Movement, 228 miles, Mean Hourly Velocity, 9.5 miles; Maximum Pressure per Square Foot, 16 3-4 lbs.

Precipitation. In inches. Total Precipitation, 1.43; Total Depth of Snow, 4 1-2; Depth of unmelted Snow on Ground at end of month, 3.

Bright Sunshine. Number of Hours Recorded, 158; Maximum Temperature in Fahrenheit Degrees, 147°.

Weather. Mean Cloudiness, on a Scale of 10, 6.3; Number of Clear Days, 8.0; Number of Cloudy Days, 16.0; Total Cloudiness recorded by the Sun Thermometer, 228 hrs.

HOURLY READINGS FROM THE
DRAPER SELF-RECORDING THERMOMETER.
IN THE SHADE.
FAHRENHEIT DEGREES.

Mar.	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Mean.
1	27	26	25	24	23	23	23	24	26	30	34	38	41	41	43	43	44	43	40	38	35	33	32	32	32.8
2	29	29	28	27	26	26	26	26	32	36	38	42	43	47	47	47	45	44	44	44	42	42	42	42	37.2
3	42	42	42	41	41	40	40	39	40	42	43	45	45	47	50	50	48	46	45	45	44	43	42	41	43.4
4	40	40	40	39	38	38	39	40	40	41	42	43	45	46	46	45	45	44	43	43	42	39	38	38	41.4
5	37	36	37	37	37	37	37	37	38	38	39	39	40	40	40	41	40	40	40	49	39	39	38	37	38.4
6	37	37	37	37	37	38	37	38	38	38	39	40	39	40	41	40	40	40	38	38	37	37	37	37	38.2
7	37	37	37	37	37	36	36	37	37	37	38	39	37	37	37	36	34	33	32	31	31	32	32	32	35.3
8	31	31	30	30	29	29	29	30	30	30	31	30	30	30	30	29	28	28	27	27	28	27	28	28	29.2
9	28	28	28	28	28	29	29	30	32	32	32	32	32	32	31	30	29	29	28	29	29	28	28	27	29.5
10	27	27	26	26	25	25	26	28	30	31	33	34	35	35	35	35	32	30	30	30	30	30	30	30	30.0
11	30	29	29	28	27	27	28	31	30	31	33	34	35	36	37	36	36	34	33	32	31	30	30	29	31.5
12	29	30	30	30	30	30	30	32	35	37	40	42	45	45	45	44	43	42	41	41	40	39	38	37	37.2
13	36	35	33	32	32	31	31	33	36	41	45	49	54	57	58	58	57	55	54	53	51	48	45	44	44.5
14	43	38	37	33	31	30	30	30	31	33	34	36	37	39	40	40	40	39	37	34	33	32	31	29	34.8
15	29	28	28	28	27	27	27	28	31	34	36	37	40	41	41	41	40	39	38	37	36	36	35	35	34.1
16	35	35	35	35	35	36	36	39	41	43	45	46	47	49	48	47	46	46	45	44	44	44	43	42	41.9
17	40	39	38	37	36	36	36	36	36	36	36	37	37	38	38	38	38	38	37	37	36	36	36	36	38.2
18	36	36	35	35	35	36	36	37	39	40	42	44	46	47	47	47	46	45	45	44	43	42	42	41	41.0
19	41	40	38	37	36	36	36	37	40	43	45	47	48	48	48	48	47	45	43	41	41	40	39	38	41.7
20	37	37	36	35	35	35	35	36	36	37	37	37	38	39	39	39	38	38	37	37	36	37	37	37	36.8
21	37	37	37	37	37	36	36	36	36	38	39	40	41	42	42	42	42	42	42	41	41	40	40	39	39.1
22	39	39	38	38	36	35	35	38	41	45	49	50	51	52	53	54	54	51	49	45	43	43	42	41	44.1
23	41	38	36	35	35	36	37	38	40	45	50	52	57	59	60	58	57	54	51	50	48	47	45	42	46.2
24	44	44	44	44	42	41	42	45	50	53	56	57	59	60	61	61	61	58	57	56	54	50	47	46	51.3
25	44	44	43	43	44	41	40	41	41	42	42	43	44	47	44	43	41	39	36	33	32	31	28	27	39.7
26	27	26	24	22	22	23	25	28	31	34	35	37	40	43	44	46	46	46	42	39	38	36	35	35	34.3
27	35	35	34	34	34	34	35	37	41	43	47	47	47	50	51	52	51	50	49	49	49	49	49	49	43.7
28	48	47	47	47	47	46	46	46	45	44	42	37	36	37	38	38	38	38	37	35	35	34	33	33	40.5
29	33	32	32	31	31	31	31	35	38	41	43	46	48	49	50	50	49	47	47	46	46	38	36	35	40.2
30	34	32	31	29	28	27	27	28	28	30	31	32	34	34	35	36	35	32	30	29	28	28	27	26	30.4
31	25	25	25	24	23	24	25	27	29	29	30	32	33	34	34	34	34	34	33	33	33	33	33	33	29.9

BAROMETER.

REDUCED TO FREEZING.

Mar	7 A. M.	2 P. M.	9 P. M.	Mean.	Maximum.	Time.	Minimum.	Time.
1	30.355	30.236	30.192	30.261	30.355	7 A. M.	30.192	9 P. M.
2	30.177	30.030	29.984	30.063	30.209	0 A. M.	29.964	12 P. M.
3	29.909	29.830	29.798	29.845	29.964	0 A. M.	29.798	9 P. M.
4	29.762	29.673	29.634	29.689	29.806	0 A. M.	29.594	12 P. M.
5	29.457	29.259	29.202	29.306	29.594	0 A. M.	29.128	12 P. M.
6	29.028	28.860	28.828	28.915	29.128	0 A. M.	28.778	12 P. M.
7	28.758	28.808	28.973	28.879	28.991	12 P. M.	28.748	5 A. M.
8	29.039	29.116	29.191	29.145	29.191	9 P. M.	28.991	0 A. M.
9	29.199	29.211	29.279	29.229	29.344	12 P. M.	29.191	0 A. M.
10	29.437	29.443	29.486	29.455	29.486	9 P. M.	29.344	0 A. M.
11	29.581	29.620	29.723	29.641	29.729	12 P. M.	29.496	0 A. M.
12	29.766	29.696	29.739	29.733	29.767	12 P. M.	29.696	3 P. M.
13	29 783	29.584	29.670	29.679	29.783	7 A. M.	29.552	3 P. M.
14	29.956	30.042	30.068	30.022	30.068	9 P. M.	29.718	0 A. M.
15	30.084	29.936	29.900	29.973	30.084	7 A. M.	29.872	12 P. M.
16	29.800	29.695	29.678	29.724	29.872	0 A. M.	29.664	12 P. M.
17	29.660	29.675	29.670	29.668	29.780	11 A. M.	29.660	7 A. M.
18	29.670	29.631	29.612	29.637	29.673	3 A. M.	29.612	9 P. M.
19	29.630	29.528	29.557	29.571	29.630	7 A. M.	29.514	6 P. M.
20	29.593	29.582	29.610	29.595	29.610	9 P. M.	29.593	4 A. M.
21	29.600	29.594	29.647	29.613	29.702	12 P. M.	29.592	5 A. M.
22	29.882	29.837	29.871	29.863	29.886	12 P. M.	29.702	0 A. M.
23	29.897	29.718	29.698	29.771	29.902	5 A. M.	29.690	7 P. M.
24	29.644	29.395	29.372	29.470	29.714	0 A. M.	29.364	5 P. M.
25	29.410	29.391	29.521	29.440	29.634	12 P. M.	29.391	2 P. M.
26	29.759	29.761	29.764	29.761	29.743	4 P. M.	29.634	0 A. M.
27	29.782	29.672	29.626	29.726	29.797	8 A. M.	29.556	12 P. M.
28	29.514	29.528	29.633	29.559	29.658	12 P. M.	29.486	9 A. M.
29	29.723	29.606	29.591	29.641	29.743	8 A. M.	29.573	5 P. M.
30	29.921	30.015	30.111	30.016	30.137	12 P. M.	29.683	0 A. M.
31	30.139	29.935	29.768	29.947	30.139	7 A. M.	29.688	12 P. M.

Sun Thermometer.

Fahrenheit degrees.

Mar.	Max. sun.	TIME.	Possible h'rs. sun.	Actual h'rs. sun.
1	137	1 p.m.	11	9
2	110	1-30 p.m.	11	5
3	115	2-30 p.m.	11	5
4	70	2 p.m.	11	0
5	54	12 m.	11	0
6	62	1 p.m.	11	0
7	104	11 a.m.	11	3
8	56	10 a.m.	11	1
9	52	12 m.	11	0
10	100	2 p. m.	11	4
11	100	1 p.m.	11	8
12	123	1 p.m.	11	6
13	124	1-30 p m.	11	8
14	118	1 p.m.	11	9
15	93	1 p.m.	11	3
16	118	3 p.m.	11	3
17	52	2 p.m.	12	0
18	111	1 p.m.	12	2
19	116	1 p.m.	12	4
20	57	1 p.m.	12	0
31	83	12 m.	12	1
22	130	2 p.m.	12	10
23	147	1-30 p.m.	12	11
24	132	10 a. m.	12	9
25	115	2-30 p.m.	12	6
26	121	2 p.m.	12	11
27	95	9 a.m.	12	5
28	49	8 a.m.	12	1
29	117	1 p.m.	12	6
30	100	1 p.m.	12	8
31	70	12 p.m.	12	0

WIND.

Mar.	DIRECTION.			MOVEMENT IN MILES FROM				FORCE IN POUNDS PER SQUARE FOOT.				
	7 A. M.	2 P. M.	9 P. M.	9 P. M. to 7 A. M.	7 A. M. to 2 P. M.	2 P. M. to 9 P. M.	TOTAL	7 A. M.	2 P. M.	9 P. M.	MAXIMUM.	TIME.
1	E. SE.	W. SW.	N.	19	9	9	37	0	0	0	0	
2		NW.	N. NW.	8	3	2	13	0	0	0	0	
3	N.	S. SW.	N. NW.	24	3	1	28	0	0	0	0	
4	N.	N. NW.	N.	14	16	54	84	0	½	0	3¼	9-30 A. M.
5	N.	N.	N.	104	112	131	347	1½	6¾	4	8½	12 M.
6	N.	N.	N.	140	111	108	359	1½	3	3¼	8½	11-30 A.M.
7	NW.	NW.	NW.	119	85	120	324	1½	5	3½	12½	5 P. M.
8	NW.	NW.	NW.	128	120	107	355	2	16¾	3	16¾	2 P. M.
9	NW.	NW.	N. NW.	133	120	85	338	6	3¾	2	18	11 A. M.
10	N.	N.	N.	99	96	74	269	¾	2	¼	4	10-30 A. M.
11	N.	N.	N.	81	85	90	256	¾	4½	1	7	4 P. M.
12	S.	SW.		25	15	40	80	0	½	0	2	12-30 P. M.
13		W. SW.	NW.	25	20	73	118	0	9	2½	9	2 P. M.
14	N.	NE.	N. NE.	112	96	46	254	2½	1	0	15	2-30 P. M.
15	N. NE.	NE.	NE.	51	87	100	238	1½	3	4	6	12 P. M.
16	NE.	NE.	NE.	126	134	173	433	6	8¾	6¾	14¼	8-30 P. M.
17	NE.	NE.	NE.	187	120	95	402	6½	5	0	9½	2 A. M.
18	N. NE.	N.	NE.	50	33	31	114	0	¾	¾	1¼	11 P. M.
19		N. NE.	NE.	26	58	47	131	0	2½	¾	6¼	10-30 P. M.
20	N.	NE.	NE.	95	125	140	360	2	5	3¼	10	11 P. M.
21	NE.	NE.	NE.	220	180	120	520	7¾	6¼	1	11¼	11-30 A. M.
22	N. NE.	NE		97	98	53	248	0	3¼	0	6½	12 M.
23		W. SW.	W. NW.	12	9	62	83	0	½	½	2½	4-30 P. M.
24		W.	W. SW.	44	65	89	198	0	4½	1	8	1 P. M.
25	NE.	NE.	NE.	51	80	120	251	4½	3	5	9	3 P. M.
26	NE.	SW.	S.	143	30	38	211	¾	½	0	7	2-30 A. M.
27	S.	SW.	S.	93	76	95	264	1	4½	1	8	5 P. M.
28	NE.	NW.	NW.	56	44	72	172	0	1	1	6	11 P. M.
29	SW.	SW.	SW.	57	45	81	183	0	6½	3	7	7 P. M.
30	NW.	NW.	NW.	110	100	80	290	2	2	0	8¾	8 A. M.
31		S.		30	43	35	108	0	½	0	1	3 P. M.

HYGROMETER.

	Dewpoint.			Force of Vapor.				Weight of Vapor in a cu. ft. of Air.			Relative Humidity.			
Feb.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	21.0	34.0	32.0	.1244	2562	.2027	.1944	1.355	2.292	2.126	93	76	91	86.6
2	24.0	36.0	38.0	.1409	.3218	.2662	.2429	1.540	2.469	2.659	94	66	84	81.3
3	35.0	39.0	37.0	.2465	.3218	.2873	.2852	2.379	2.759	2.563	84	72	78	78.0
4	34.0	35.0	38.0	.2371	.3099	.2662	.2710	2.292	2.379	2.659	83	65	84	77.3
5	36.0	38.0	38.0	.2193	.2465	.2371	.2343	2.469	2.659	2.659	96	92	96	94.6
6	35.0	38.0	32.0	.2193	.2465	.2193	.2283	2.379	2.659	21.26	91	92	82	88.3
7	31.0	29.0	25.0	.2109	.2193	.1728	.2010	2.046	1.892	1.606	82	74	79	78.3
8	23.0	21.0	22.0	.1593	.1659	.1530	.1594	1.476	1.355	1.415	78	68	78	74.6
9	23.0	27.0	20.0	.1593	.1799	.1593	.1661	1.476	1.745	1.298	78	80	67	75.0
10	16.0	27.0	24.0	.1409	.2027	.1659	.1698	1.090	1.745	1.540	65	72	79	72.0
11	18.0	31.0	22.0	.1530	.2109	.1728	.1789	1.190	2.016	1.415	67	82	69	79.3
12	27.0	33.0	38.0	.1659	.2984	.2465	.2369	1.745	2.208	2.659	90	64	92	82.0
13	28.0	44.0	41.0	.1728	.4645	.3734	.3369	1.817	3.306	2.967	90	61	68	73.0
14	21.0	22.0	25.0	.1659	.2371	.1872	.1967	1.355	1.415	1.606	68	51	71	63.3
15	21.0	28.0	28.0	.1469	.2562	.2109	.2046	1.355	1.817	1.817	77	60	73	70.0
16	18.0	23.0	26.0	.2109	.3467	.2873	.2816	1.190	1.476	1.674	47	36	49	44.0
17	34.0	36.0	35.0	.2109	.2280	.2109	.2166	2.292	2.469	2.379	91	92	96	93.0
18	34.0	36.0	39.0	.2109	.3218	.2766	.2697	2.292	2.469	2.759	91	66	85	80.6
19	31.0	35.0	34.0	.2109	.3341	.2562	.2670	20.46	2.379	2.292	82	60	76	72.6
20	30.0	29.0	31.0	.2027	.2371	.2109	.2135	1.969	1.892	2.046	81	67	82	76.6
21	31.0	33.0	28.0	.2109	.2662	.2562	.2444	2.046	2.208	1.817	82	69	60	77.0
22	24.0	21.0	36.0	20.27	.3874	.2766	.2889	1.540	1.355	2.469	64	29	77	56.6
23	32.0	33.0	40.0	.2193	.4990	.3341	.3508	2.126	2.208	2.862	82	38	73	60.0
24	35.0	38.0	40.0	.2662	.5170	.4167	.3999	2.379	2.659	2.862	77	44	59	60.0
25	27.0	27.0	23.0	.2465	.3218	.1799	.2494	1.745	1.745	1.476	59	46	70	58.3
26	18.0	28.0	33.0	.1352	.2766	.2280	.2132	1.190	1.817	2.208	76	55	83	71.3
27	30.0	37.0	45.0	.2027	.3598	.3467	.3030	1.969	2 563	3.426	81	61	86	76.0
28	45.0	35.0	30.0	.3099	.2193	.2027	.2439	3.426	2.379	1.969	93	91	81	88.0
29	22.0	36.0	45.0	.1728	.3467	.3099	.2764	1.415	2.460	3.426	69	60	96	75.0
30	24.0	26.0	14.0	.1469	.1948	.1530	.1649	1.540	1.674	0.999	89	72	56	72.3
31	22.0	32.0	31.0	.1352	.1948	.1872	.1724	1.415	2.126	2.046	88	95	95	92.6

THERMOMETER.

(IN THE SHADE.)

FAHRENHEIT DEGREES.

	7 A. M.		2 P. M.		9 P. M.		MEAN.		MAXIMUM.				MINIMUM.			
FEB.	DRY.	WET.	DRY.	WET.	DRY.	WET.	DRY.	WET.	DRY.	TIME.	WET.	TIME.	DRY.	TIME.	WET.	TIME.
1	23	23	41	38	35	34	33.0	31.6	41	2 P. M.	38	2 P. M.	23	7 A. M.	23	7 A. M.
2	26	26	47	42	42	40	38.3	36.0	47	2 P. M.	42	2 P. M.	26	7 A. M.	26	7 A. M.
3	40	38	47	43	44	41	47.0	40.6	47	2 P. M.	43	2 P. M.	40	7 A. M.	38	7 A. M.
4	39	37	46	41	42	40	42.3	39.3	46	2 P. M.	41	2 P. M.	39	7 A. M.	37	7 A. M.
5	37	37	40	39	39	39	38.6	38.3	40	2 P. M.	39	2 P. M.	37	7 A. M.	37	7 A. M.
6	37	36	40	39	37	35	38.0	36.6	40	2 P. M.	39	2 P. M.	37	9 P. M.	35	9 P. M.
7	36	34	37	34	31	29	34.6	32.3	37	2 P. M.	34	2 P. M.	31	9 P. M.	29	9 P. M.
8	29	27	27	27	38	26	29.0	27.3	30	2 P. M.	27	2 P. M.	28	9 P. M.	26	9 P. M.
9	29	27	30	30	29	26	30.0	27.6	32	2 P. M.	30	2 P. M.	29	9 P. M.	26	9 P. M.
10	26	23	35	32	30	28	30.3	27.6	35	2 P. M.	32	2 P. M.	26	7 A. M.	23	7 A. M.
11	28	25	36	34	31	28	31.6	29.0	36	2 P. M.	34	2 P. M.	28	7 A. M.	25	7 A. M.
12	30	29	45	40	40	39	38.3	33.0	45	2 P. M.	40	2 P. M.	30	7 A. M.	29	7 A. M.
13	31	30	57	50	51	46	46.3	40.3	57	2 P. M.	50	2 P. M.	31	7 A. M.	30	7 A. M.
14	30	27	39	33	33	30	34.0	30.0	39	2 P. M.	33	2 P. M.	30	7 A. M.	27	7 A. M.
15	27	25	41	36	36	33	34.6	31.3	41	2 P. M.	36	2 P. M.	27	7 A. M.	25	7 A. M.
16	36	30	49	39	44	37	43.0	35.3	49	2 P. M.	39	2 P. M.	36	7 A. M.	30	7 A. M.
17	36	35	38	37	36	36	36.6	36.0	38	2 P. M.	37	2 P. M.	36	7 A. M.	35	7 A. M.
18	36	35	47	42	43	41	42.0	39.3	47	2 P. M.	42	2 P. M.	36	7 A. M.	25	7 A. M.
19	36	34	48	42	41	38	41.6	38.0	48	2 P. M.	42	2 P. M.	36	7 A. M.	34	7 A. M.
20	35	33	39	35	36	34	36.6	34.0	39	2 P. M.	35	2 P. M.	35	7 A. M.	33	7 A. M.
21	36	34	42	38	41	36	43.0	36.0	42	2 P. M.	38	2 P. M.	36	7 A. M.	34	7 A. M.
22	35	31	52	40	43	40	43.3	37.0	52	2 P. M.	40	2 P. M.	35	7 A. M.	31	7 A. M.
23	37	35	59	47	48	44	48.0	43.0	59	2 P. M.	47	2 P. M.	37	7 A. M.	35	7 A. M.
24	42	39	60	49	54	47	52.0	43.0	60	2 P. M.	49	2 P. M.	42	7 A. M.	39	7 A. M.
25	40	35	47	39	32	29	39.6	34.3	47	2 P. M.	39	2 P. M.	32	9 P. M.	29	9 P. M.
26	25	23	43	37	38	36	35.3	32.0	43	2 P. M.	37	2 P. M.	25	7 A. M.	23	7 A. M.
27	35	33	40	34	49	47	41.3	38.0	49	9 P. M.	47	9 P. M.	35	7 A. M.	33	7 A. M.
28	46	45	37	36	35	33	39.0	37.6	45	7 A. M.	44	7 A. M.	35	9 P. M.	33	9 P. M.
29	31	28	49	43	46	46	42.0	39.0	49	2 P. M.	46	9 P. M.	31	7 A. M.	28	7 A. M.
30	27	26	34	31	28	24	29.6	27.0	34	2 P. M.	31	9 P. M.	27	7 A. M.	24	9 P. M.
31	25	24	34	34	33	33	30.6	30.3	34	2 P. M.	34	9 P. M.	25	7 A. M.	24	7 A. M.

CLOUDS. RAIN AND SNOW.

Day.	Clear—3. Overcast—10.			Depth In inches.				
	7 A.M.	2 P.M.	9 P.M.	Beginn'g	Ending.	Duration.	Water.	Snow.
1	0	0	0					
2	10	9	10					
3	10	9	10	7.30 A.M.	3 P.M.	7½	.01	
4	10	10	10	8 P.M.				
5	10	10	10	6 P.M.	8 A.M.	12	.30	
6	10	10	10	6 P.M.	2 P.M. Early night	20	.35	
7	5	5	5					
8	8	10	10					
9	10	10	10					
10	5	5	2					
11	1	1	2					
12	10	9	0					
13	2	3	1					
14	1	1	0					
15	5	10	9					
16	9	9	10					
17	10	10	10	7.30 A.M.	9 A.M.	1½	.01	
18	9	10	10	2 A.M.	9 A.M.	7	.03	
19	5	8	10					
20	10	10	10					
21	10	10	1					
22	1	0	0					
23	8	1	0					
24	0	1	0					
25	9	2	0					
26	0	1	1					
27	9	10	10	12 P.M.	1 A.M.			
28	10	10	1	9-30 A.M.	1 P.M.	4½	.30	
29	1	1	10	8 P.M.	11 P.M.	3	.03	
30	1	3	0					
31	10	10	10	9 A.M.	5 P.M.	8	.40	4½

REMARKS.

Day.	7 A. M.	2 P. M.	9 P. M.
1	cold—clear—smoky.	clear—mild- smoky.	clear—mild.
2	overcast—cold — smoky.	cloudy—mild,smoky	overcast—mild.
3	overcast — mild— foggy.	cloudy—mild—misty.	overcast — mild — foggy.
4	overcast — mild —foggy.	overcast —mild— smoky.	overcast—mild—storm'g.
5	overcast—mild—raining.	overcast – mild — foggy.	overcast—mild—raining.
6	overcast—mild—raining	overcast—mild—raining.	overcast —mild — misty.
7	fair—mild.	fair—mild.	fair—cold.
8	cloudy—cold.	overcast—cold.	overcast—cold.
9	overcast—cold.	overcast—cold.	overcast—cold.
10	fair—cold.	fair – mild.	clear—cold.
11	clear—cold.	clear—mild.	clear—cold.
12	overcast—cold.	cloudy—mild.	clear—mild—smoky.
13	clear—cold—smoky.	clear—warm, smoky.	clear — warm — smoky.
14	clear—cold.	clear—mild – smoky.	clear—mild.
15	fair—cold—smoky.	overcast— mild— smoky.	cloudy—mild.
16	cloudy—mild.	cloudy—mild.	overcast — mild— misty.
17	overcast—mild.	overcast — mild — misty.	overcast — mild —misty.
18	cloudy—mild.	overcast—mild.	overcast—mild.
19	fair—mild—smoky.	cloudy—mild.	overcast—mild.
20	overcast—mild.	overcast—mild.	overcast—storming.
21	overcast—mild.	overcast—mild.	clear—mild.
22	clear—mild.	clear—warm.	clear—mild.
23	cloudy—mild.	clear—warm.	clear—mild.
24	clear—mild.	clear—warm.	clear—warm.
25	cloudy—mild.	clear.	clear—cold.
26	clear—cold.	clear—mild.	clear--mild.
27	cloudy—mild, raw wind.	overcast—warm.	overcast—mild.
28	overcast—mild—foggy	overcast—mild.	overcast—mild.
29	clear—mild.	clear—mild.	overcast—raining.
30	clear—cold.	clear—mild.	clear—cold.
31	overcast—cold.	overcast—snowing.	overcast—raining.

C. D. WARNER. *Meteorologist.*

BULLETIN No. 4. APRIL, 1889.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

Pressure. In inches. Actual maximum reading 30.230; Mean reduced to 32° F., 29.495; Monthly Range, 1.176.

Air Temperature. In Degrees Fahrenheit. Mean, 50.8°; Highest, 78.0°; Lowest, 30.0°; Monthly Range, 48.0°; Highest Mean Daily, 64.1°; Lowest Mean Daily, 34.4°; Mean Maximum, 56.6°; Mean Minimum, 45.6°; Mean Daily Range, 13.1°; Greatest Daily Range, 35.0°.

Humidity. Mean Dew Point, 43.8; Mean Relative Humidity, 78.3; Mean Force of Vapor, 33.98.

Wind. Prevailing Direction, N.; Total Movement, 5648 miles; Greatest Daily Movement, 348 miles, 8th; Least Daily Movement, 56 miles, 5th; Mean Daily Movement, 202 miles, Mean Hourly Velocity, 8.4 miles; Maximum Pressure per Square Foot, 15 1-2 lbs.

Precipitation. In inches. Total Precipitation, 2.87; Total Depth of Snow, 1-2.

Bright Sunshine. Number of Hours Recorded, 191.

Weather. Mean Cloudiness, on a Scale of 10, 5.5; Number of Clear Days, 10.; Number of Cloudy Days, 11.; Number of Fair Days, 9.; Total Cloudiness recorded by the Sun Thermometer, 195 hrs, or 55 per cent.

HOURLY READINGS FROM THE

DRAPER SELF-RECORDING THERMOMETER.

IN THE SHADE.

FAHRENHEIT DEGREES.

Day.	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Mean.
1	33	33	33	33	33	33	33	34	34	34	35	35	35	36	36	36	36	36	36	35	35	34	34	34	34.4
2	34	34	34	34	34	34	34	35	36	37	39	40	42	43	45	45	45	42	41	40	40	40	40	41	38.7
3	41	40	39	37	37	37	37	41	42	45	45	43	41	40	41	41	40	40	39	38	38	38	38	37	39.8
4	36	36	37	37	38	38	39	40	42	44	45	48	48	49	49	49	47	45	44	43	41	40	38	38	42.1
5	38	37	37	37	37	37	37	38	40	43	45	46	47	47	47	47	46	45	44	43	43	42	41	40	41.8
6	40	39	39	37	35	34	35	42	43	45	46	47	47	48	49	48	49	48	47	44	43	42	38	35	42.5
7	34	32	32	31	30	31	31	35	40	45	47	47	48	48	49	49	48	46	43	41	39	38	37	37	39.9
8	36	37	37	37	36	36	38	42	46	48	50	51	53	54	54	54	52	51	49	46	45	43	42	40	44.8
9	40	39	37	36	35	35	36	42	47	50	54	56	59	60	61	62	61	60	57	54	51	50	49	48	49.1
10	45	43	43	41	40	39	41	45	48	49	50	52	53	55	55	56	56	54	52	50	47	46	45	43	47.8
11	41	40	40	37	35	34	36	42	47	54	58	62	66	68	68	69	66	63	59	57	55	54	53	52	52.3
12	51	51	51	51	50	50	50	53	56	59	60	61	60	61	61	61	59	59	57	56	57	53	50	50	55.1
13	49	47	46	44	43	42	41	42	43	46	48	49	51	51	51	50	50	47	43	40	38	38	37	37	44.7
14	35	34	34	33	33	34	36	39	42	44	46	48	50	50	51	52	51	50	48	46	44	42	41	40	42.6
15	38	37	35	34	33	32	35	40	45	48	51	53	56	57	58	59	59	58	54	51	48	46	45	42	46.4
16	38	36	35	34	33	33	35	40	50	54	56	58	59	59	59	59	56	54	52	50	47	47	44	43	47.1
17	42	40	39	39	37	36	37	43	49	52	55	57	57	57	58	58	56	53	52	52	51	51	51	50	48.8
18	50	50	50	50	50	50	50	51	54	56	57	59	60	60	61	62	62	64	62	60	59	58	57	56	56.1
19	55	54	53	53	52	53	53	56	59	65	70	72	74	76	77	78	77	75	70	67	66	64	62	60	64.1
20	58	57	56	55	54	54	58	60	65	71	73	74	74	76	75	63	63	63	63	63	62	62	61	60	63.3
21	59	58	58	57	56	56	59	60	62	65	68	72	49	74	76	75	60	57	54	50	47	46	46	44	59.7
22	42	42	41	40	40	36	42	44	44	45	46	47	55	49	49	49	49	46	44	42	41	40	38	37	43.5
23	36	35	34	34	34	37	41	43	45	49	52	54	54	56	57	57	57	55	50	48	46	45	44	44	46.1
24	42	42	42	42	42	42	46	50	53	56	60	62	64	65	65	63	62	60	59	57	56	56	55	54	53.9
25	54	54	55	55	55	55	57	60	64	66	67	68	69	69	68	68	67	66	64	61	59	59	59	59	61.5
26	59	59	59	59	59	59	59	61	62	62	65	65	67	67	66	64	60	57	56	55	55	55	55	54	59.9
27	54	54	54	53	53	53	53	56	56	60	59	60	62	61	60	60	60	60	59	59	58	57	56	55	57.1
28	55	53	52	51	51	51	52	53	53	54	56	56	56	57	57	57	57	57	57	56	55	54	53	52	54.3
29	51	50	49	48	48	48	49	53	56	57	57	57	56	55	55	56	55	55	53	51	49	48	47	47	52.0
30	47	47	47	46	46	46	46	46	48	50	51	51	52	53	52	52	49	49	48	48	47	46	46	45	48.2

BAROMETER.

REDUCED TO FREEZING.

Day	7 A. M.	2 P. M.	9 P. M.	Mean.	Maximum.	Time.	Minimum.	Time.
1	29.648	29.670	29.673	29.663	29.675	10 P. M.	29.648	4 A. M.
2	29.555	29.482	29.510	29.515	29.665	0 A. M.	29.466	4 P. M.
3	29.598	29.600	29.425	29.541	29.604	9 A. M.	29.407	4 P. M.
4	29.492	29.576	29.687	29.585	29.695	12 P. M.	29.438	0 A. M.
5	29.788	29.771	28.782	29.780	29.788	7 A. M.	28.695	0 A. M.
6	29.912	29.998	30.091	30.000	30.142	12 P. M.	28.799	0 A. M.
7	30.153	30.148	30.152	30.151	30.191	9 A. M.	30.142	0 A. M.
8	30.114	29.922	29.886	29.977	30.157	0 A. M.	29.839	12 P. M.
9	29.770	29.537	29.511	29.606	29.839	0 A. M.	29.477	6 P. M.
10	29.557	29.570	29.631	29.586	29.662	12 P. M.	29.540	0 A. M.
11	29.730	29.596	29.560	29.629	29.731	9 A. M.	29.548	12 P. M.
12	29.453	29.274	29.264	29.330	29.548	0 A. M.	29.246	3 P. M.
13	29 367	29.401	29.655	29.474	29.698	12 P. M.	29.283	0 A. M.
14	29.780	29.773	29.918	29.823	30.069	12 P. M.	29.698	0 A. M.
15	30.092	30.064	30.148	30.101	30.164	12 P. M.	30.064	7 A. M.
16	30.192	30.088	30.080	30.116	30.192	7 A. M.	30.074	12 P. M.
17	30.067	29.884	29.820	29.923	30.074	0 A. M.	29.792	12 P. M.
18	29.762	29.735	29.748	29.748	29.792	0 A. M.	29.725	6 P. M.
19	29.804	29.713	29.742	29.753	29.818	9 A. M.	29.667	4 P. M.
20	29.751	29.634	29.700	29.695	29.762	6 A. M.	29.623	4 P. M.
21	29.688	29.418	29.661	29.589	29.705	0 A. M.	29.375	4 P. M.
22	29.864	29.875	30.026	29.921	30.047	12 P. M.	29.708	0 A. M.
23	30.166	30.066	30.083	30.105	30.176	9 A. M.	30.047	0 A. M.
24	30.083	29.892	29.926	29.967	30.094	6 A. M.	29.877	3 P. M.
25	29.854	29.661	29.698	29.737	29.922	0 A. M.	29.654	3 P. M.
26	29.640	29.528	29.400	29.522	29.698	0 A. M.	29.393	12 P. M.
27	29.265	29.184	29.023	29.154	29 393	0 A. M.	29.023	9 P. M.
28	29.019	29.036	29.180	29.078	29.228	12 P. M.	29.016	1 A. M.
29	29.236	29.230	29.286	29.250	29.321	12 P. M.	29.215	10 A. M.
30	29.404	29.415	29.521	29.446	29.566	12 P. M.	29.321	0 A. M.

Sun Thermometer.

Day.	Possible h'rs. sun.	Actual h'rs. sun.
1	12	0
2	12	3
3	12	3
4	12	6
5	12	4
6	12	3
7	13	8
8	13	7
9	13	11
10	13	12
11	13	10
12	13	1
13	13	4
14	13	8
15	13	11
16	13	9
17	13	7
18	13	0
19	13	13
20	13	7
21	13	10
22	13	4
23	13	10
24	13	9
25	13	8
26	13	6
27	13	10
28	13	0
29	14	3
30	14	4

WIND.

	DIRECTION.			MOVEMENT IN MILES FROM				FORCE IN POUNDS PER SQUARE FOOT.				
Day.	7 A. M.	2 P. M.	9 P. M.	9 P. M. to 7 A. M.	7 A. M. to 2 P. M.	2 P. M. to 9 P. M.	TOTAL	7 A. M.	2 P. M.	9 P. M.	MAXIMUM.	TIME.
1	N.		N.	22	30	24	76	0	0	0	0	
2		N. NW.		66	28	25	119	¼	0	0	1¼	5 P. M.
3	W. SW.		N.	42	18	34	94	0	0	0	3	2 A. M.
4	N.	N.		27	76	60	163	½	1½	0	5½	10 A. M.
5	N.	N.		12	23	21	56	0	0	0	½	3 P. M.
6	N.	E.	E.	26	65	42	133	0	½	0	3	9 A. M.
7	N. NE.	E. SE.	E. SE.	28	83	120	231	0	4	¾	6¾	10-30 A. M.
8	NE.	NE.	E.	100	160	88	348	1½	6	1¼	11	9-15 A. M.
9	N. NE.	N. NE.		52	85	65	202	0	9	0	9	2 P. M.
10	N. NE.	N.		22	88	66	176	2	3	0	5½	9-15 A. M.
11		SW.	SW.	18	36	66	120	0	2	1	4	6 P. M.
12	S. SW.	W. NW.	N. NE.	61	27	37	125	0	2	4½	4½	9 P. M.
13	N. NE.	N. NE.	N. NE.	109	94	86	289	4	4	2	9	11-30 A. M.
14	N.	N.	NE.	33	60	50	143	3	1	0	6½	4 P. M.
15	NE.	E.	S. SE.	13	35	52	100	0	½	0	4	3-30 P. M.
16	N.	E. SE.	E. SE.	12	65	75	152	0	5	½	5	2 P. M.
17	N.	NE.	NE.	45	100	100	245	0	3	5	8½	10 P. M.
18	N. NE.	N. NE.	S.	120	49	19	188	1	0	¼	3¾	4 A. M.
19	SW.	SW.	S.	5	12	55	72	0	0	1	4	9-30 P. M.
20	S. SW.	W. SW.		91	25	29	145	0	¾		4¾	3.30 P. M.
21		W. SW.	NW.	28	47	131	206	0	8½	6½	15½	4 P. M.
22	NW.	NW.	NW.	89	100	77	266	4	6	1	10	3 P. M.
23	SE.	S.		21	32	76	129	0	3	2½	5	5 P. M.
24	S.	S.	SW.	114	110	122	346	2	7½	6	10¼	2-30 P. M.
25	SW.	SW.	SW.	108	100	100	308	2	7¼	½	10	8 A. M.
26	SE.	SE.	SE.	107	93	126	326	1¼	1	1	6¾	8-30 P. M.
27	SE.	E. SE.	S.	86	88	100	274	3	2½	3	5½	11 A. M.
28	S.	SW.	SW.	129	91	90	220	½	3	4	8	6 P. M.
29	W. SW.	NW.	NW.	90	30	70	190	0	1	2½	5½	6-30 P. M.
30	NW.	NW.	NW.	106	74	96	206	2	6¼	1½	8¾	3 P. M.

HYGROMETER.

Day.	Dewpoint.			Force of Vapor.				Weight of Vapor in a cu. ft. of Air.			Relative Humidity.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Mean.
1	31.0	35.0	33.0	.1872	.2109	.2027	.2002	2.046	2.379	2.208	95	96	95	95.0
2	28.0	39.0	35.0	.1948	.2766	.2465	.2393	1.892	2.759	2.379	81	85	84	83.0
3	32.0	38.0	36.0	.2193	.2465	.2280	.2312	2.126	2.659	2.469	82	92	92	87.0
4	34.0	33.0	36.0	.2371	.3467	.2562	.2800	2.292	2.208	2.469	83	54	84	74.0
5	32.0	33.0	36.0	.2193	.3218	.2766	.2725	2.126	2.208	2.469	82	59	77	73.0
6	30.0	32.0	39.0	.2027	.3341	.2766	.2711	1.969	2.126	2.759	81	53	85	73.0
7	25.0	32.0	29.0	.1728	.3341	.2371	.2480	1.606	2.126	1.892	79	53	67	66.0
8	33.0	25.0	36.0	.2280	.4167	.2984	.3143	2.208	1.606	2.469	83	32	71	62.0
9	25.0	35.0	41.0	.2109	.5170	.3734	.3671	1.606	2.379	2.967	64	39	68	57.0
10	31.0	27.0	39.0	.2562	.4322	.3218	.3367	2.046	1.745	2.759	68	33	72	58.0
11	31.0	42.0	52.0	.2109	.6836	.4322	.4422	2.046	3.076	4.383	82	38	88	69.0
12	46.0	50.0	52.0	.3598	.5357	.4167	.4374	3.550	4.089	4.383	87	68	94	83.0
13	34.0	19.0	28.0	.2562	.3734	.2280	.2858	2.292	1.243	1.817	76	28	66	57.0
14	25.0	31.0	35.0	.2109	.3598	.2873	.2860	1.606	2.646	2.379	64	49	70	61.0
15	30.0	36.0	40.0	.2027	.4645	.3341	.3337	1.969	2.469	2.862	81	45	73	66.0
16	27.0	33.0	33.0	.2027	.4990	.3218	.3411	1.745	2.208	2.208	72	38	59	56.0
17	32.0	44.0	45.0	.2193	.4645	.3734	.3854	2.126	3.306	3.426	82	61	81	75.0
18	49.0	57.0	58.0	.3598	.5170	.4990	.4586	3.948	5.202	5.381	97	89	97	94.0
19	52.0	53.0	59.0	.4018	.8957	.6163	.6379	4.383	4.537	5.566	97	45	80	74.0
20	55.0	61.0	57.0	.4815	.8957	.5549	.6440	4.860	5.952	5.202	89	59	84	77.0
21	54.0	50.0	39.0	.4990	.8379	.3218	.5529	4.696	4.089	2.759	83	43	72	69.0
22	35.0	30.0	34.0	.2665	.3467	.2562	.2897	2.379	1.969	2.292	77	48	76	67.0
23	28.0	40.0	40.0	.5262	.4481	.3099	.3380	1.817	2.862	2.862	60	55	79	65.0
24	42.0	51.0	53.0	.3099	.6163	.4481	.4581	3.076	4.234	4.537	85	61	88	75.0
25	54.0	56.0	58.0	.4645	.7074	.4990	.5569	4.696	5.028	5.381	88	63	97	83.0
26	56.0	54.0	54.0	.4990	.6605	.4322	.5305	5.028	4.696	4.696	89	62	97	83.0
27	51.0	56.0	57.0	.4018	.5357	.4815	.4730	4.234	5.028	5.202	94	84	97	91.6
28	51.0	52.0	52.0	.3874	.4645	.4322	.4280	4.234	4.383	4.383	97	83	88	89.3
29	45.0	50.0	43.0	.3467	.4322	.3467	.3752	3.426	3.189	3.189	86	82	80	82.6
30	40.0	41.0	41.0	.3099	.4018	.3218	.3445	2.862	2.967	2 967	79	63	79	73.6

THERMOMETER.

(IN THE SHADE.)

FAHRENHEIT DEGREES.

	7 A. M.		2 P. M.		9 P. M.		MEAN.		MAXIMUM.				MINIMUM.			
DAY.	DRY.	WET.	DRY.	WET.	DRY.	WET.	DRY.	WET.	DRY.	TIME.	WET.	TIME.	DRY.	TIME.	WET.	TIME.
1	33	33	36	36	35	35	35.6	35 6	36	2 P. M.	36	2 P. M.	33	7 A. M.	33	7 A. M.
2	34	32	43	41	40	38	39.0	37.0	43	2 P. M.	41	2 P. M.	34	7 A. M.	32	7 A. M.
3	37	35	40	39	38	37	38.3	37.0	40	2 P. M.	39	2 P. M.	37	7 A. M.	35	7 A. M.
4	39	37	49	42	41	39	43.0	39.3	49	2 P. M.	42	2 P. M.	39	7 A. M.	37	7 A. M.
5	37	35	47	41	43	40	42.3	38.6	47	2 P. M.	41	2 P. M.	37	7 A. M.	35	7 A. M.
6	35	33	48	41	43	41	42.0	38.3	48	2 P. M.	41	2 P. M.	35	7 A. M.	33	7 A. M.
7	31	29	48	41	39	35	39.3	35.0	48	2 P. M.	41	2 P. M.	31	7 A. M.	29	7 A. M.
8	38	36	54	42	45	41	45.6	39.6	54	2 P. M.	42	2 P. M.	38	7 A. M.	36	7 A. M.
9	36	32	60	48	51	46	49.0	42.0	60	2 P. M.	48	2 P. M.	36	7 A. M.	32	7 A. M.
10	41	37	55	43	47	43	47.6	41.0	55	2 P. M.	43	2 P. M.	41	7 A. M.	37	7 A. M.
11	36	34	68	54	55	53	53.0	47.0	68	2 P. M.	54	2 P. M.	36	7 A. M.	34	7 A. M.
12	50	48	61	56	54	53	55.0	52.3	61	2 P. M.	56	2 P. M.	50	7 A. M.	48	7 A. M.
13	41	38	51	39	38	34	43.3	37.0	51	2 P. M.	39	2 P. M.	38	9 P. M.	34	9 P. M.
14	36	32	50	42	44	40	43.3	38.0	50	2 P. M.	42	2 P. M.	36	7 A. M.	32	7 A. M.
15	35	33	57	47	48	44	46.6	41.3	57	2 P. M.	47	2 P. M.	35	7 A. M.	33	7 A. M.
16	35	32	59	47	47	41	47.0	40.0	59	2 P. M.	47	2 P. M.	35	7 A. M.	32	7 A. M.
17	37	35	57	50	51	48	48.3	44.3	57	2 P. M.	50	2 P. M.	37	7 A. M.	35	7 A. M.
18	50	49	60	58	59	59	56.3	55.3	60	2 P. M.	59	9 P. M.	50	7 A. M.	49	7 A. M.
19	53	52	76	62	65	61	64.6	58.3	76	2 P. M.	62	2 P. M.	53	7 A. M.	52	7 A. M.
20	58	56	76	66	62	59	65.3	60.3	76	2 P. M.	66	2 P. M.	58	7 A. M.	56	7 A. M.
21	59	56	74	60	47	43	60.0	53.0	74	2 P. M.	60	2 P. M.	47	9 P. M.	43	9 P. M.
22	42	39	49	41	41	38	44.0	39.3	49	2 P. M.	41	2 P. M.	41	9 P. M.	38	9 P. M.
23	41	36	56	48	46	43	47.6	42.3	56	2 P. M.	48	2 P. M.	41	7 A. M.	36	7 A. M.
24	46	44	65	57	56	54	55.6	51.6	65	2 P. M.	57	2 P. M.	46	7 A. M.	44	7 A. M.
25	57	55	69	61	59	59	61.6	58.3	69	2 P. M.	61	2 P. M.	57	7 A. M.	55	7 A. M.
26	59	57	67	49	55	55	60.3	57.0	67	2 P. M.	59	2 P. M.	55	9 P. M.	55	9 P. M.
27	53	52	61	58	58	58	57.3	56.0	61	2 P. M.	58	2 P. M.	53	7 A. M.	52	7 A. M.
28	52	51	57	54	55	53	54.6	52.6	57	2 P. M.	54	2 P. M.	52	7 A. M.	51	7 A. M.
29	49	47	55	52	49	46	51.0	48.3	55	2 P. M.	52	2 P. M.	49	9 P. M.	46	9 P. M.
30	46	43	53	47	47	44	48.6	44.6	53	2 P. M.	47	2 P. M.	46	7 A. M.	43	7 A. M.

	CLOUDS.			RAIN AND SNOW.				
Day.	Clear—3. Overcast—10.			Depth In inches.				
	7 A.M.	2 P.M.	9 P.M.	Beginn'g	Ending.	Duration.	Water.	Snow.
1	10	10	10	MAR. 31 6 P. M.				
2	10	9	9		9 A.M.	39	.95	½
3	2	10	8	10.30 A.M.	12 M.	1½	.05	
4	8	3	3					
5	9	9	10					
6	0	9	0					
7	5	8	01					
8	1	4	01					
9	1	1	0					
10	1	1	0					
11	1	2	2	12 P.M.	In night.		.03	
12	9	9	10					
13	3	1	1					
14	1	3	1					
15	1	1	1					
16	3	3	3					
17	3	7	10				Inappreciable.	
18	10	10	3	12.30 P.M.				
19		2	1					
20	2	4	8	3.30 P.M.	4 P.M.	½	.58	
21	8	0	1					
22	0	1	0					
23	0	1	1					
24	4	2	1					
25	2	6	10	8 P.M.	In night.		.31	
26	2	10	10	11.30 A.M.	"		.94	
27	9	10	10	2.30 P.M.	"			
28	10	10	1					
29	6	9	3					
30	4	4	9					

REMARKS.

Day.	7 A. M.	2 P. M.	9 P. M.
1	overcast—raining.	overcast—raining.	overcast—raining.
2	overcast—mild.	cloudy—mild.	cloudy—mild.
3	clear—pleasant.	overcast—mild.	cloudy—mild
4	cloudy—mild.	clear—pleasant.	clear—pleasant.
5	cloudy—mild.	cloudy—mild.	overcast—mild.
6	clear—pleasant.	cloudy—mild.	clear—pleasant.
7	fair—cold.	cloudy—mild.	clear—pleasant.
8	clear—pleasant.	fair—warm.	clear—pleasant.
9	clear—pleasant.	clear—warm.	clear—warm.
10	clear—pleasant.	clear—warm.	clear—mild.
11	clear—pleasant.	clear—warm.	clear—warm.
12	cloudy—warm.	cloudy—warm.	overcast—warm.
13	fair—mild.	clear—warm.	clear—pleasant.
14	clear—pleasant.	clear—warm.	clear—pleasant.
15	clear—pleasant.	clear—warm.	clear—pleasant.
16	clear—pleasant.	clear—warm.	clear—pleasant.
17	clear—pleasant.	fair—warm.	overcast—warm.
18	overcast—warm.	overcast—warm.	fair—warm.
19	dense fog—warm.	clear—warm.	clear—warm.
20	clear—warm.	fair—warm.	cloudy—warm.
21	cloudy—warm.	clear—warm.	clear—pleasant.
22	clear—pleasant.	clear—pleasant.	clear—pleasant.
23	clear—pleasant.	clear—warm.	clear—pleasant.
24	clear—pleasant.	clear—warm.	clear—warm.
25	clear—warm.	fair—warm.	overcast—warm.
26	clear—warm.	overcast—warm.	overcast—raining.
27	cloudy—warm.	overcast—warm.	overcast—raining.
28	overcast—misty.	overcast—warm.	clear—warm.
29	fair—mild—fog.	cloudy—misty.	clear—mild.
30	fair—mild.	fair- mild.	cloudy—mild.

C. D. WARNER. *Meteorologist.*

BULLETIN No. 5. MAY, 1889.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.110; Mean reduced to 32° F., 29.626; Monthly Range, 0.836.

Air Temperature. In Degrees Fahrenheit. Mean, 61.4°; Highest, 88.0°; Lowest, 40.0°; Monthly Range, 48.0°; Highest Mean Daily, 73.0°; Lowest Mean Daily, 46.9°; Mean Maximum, 71.4°; Mean Minimum, 51.0°; Mean Daily Range, 19.7°; Greatest Daily Range, 33.0°.

Humidity. Mean Dew Point, 52.8°; Mean Relative Humidity, 73.8°; Mean Force of Vapor, .5801.

Wind. Prevailing Directions, N. and S.; Total Movement, 4056 miles; Greatest Daily Movement, 405 miles, 31st; Least Daily Movement, 55 miles, 12th; Mean Daily Movement, 130.8 miles, Mean Hourly Velocity, 5.5 miles; Maximum Pressure per Square Foot, 9 lbs.

Precipitation. In inches. Total Precipitation, 4.71.

Bright Sunshine. Number of Hours Recorded, 270.

Weather. Mean Cloudiness, on a Scale of 10, 4.2; Number of Clear Days, 13.; Number of Cloudy Days, 4; Number of Fair Days, 11; Total Cloudiness recorded by the Sun Thermometer, 168 hrs, or 38 per cent.

Frost, In low lands, on the night of 26th.

Thunder and Lightning, 10th, 14th and 24th.

DAILY SUMMARY.

MAY 1. Barometer reduced to 32° F., max. 29.649, min. 29.566, mean 29.614.
Temperature, max. 53°, min. 41°, mean hourly 46.9°.
Sun Thermometer, max. 119°, 9 A. M., bright sunshine 10 hrs.
Mean humidity 61°, mean force vapor .3245, mean dew point 34°.
Wind, N. W., total movement, 139 m., mean hourly velocity, 5.8 m., max. pressure, 8 lbs., 4 A. M.

2. Barometer reduced to 32° F., max. 29.666, min. 29.552, mean 29.610.
Temperature, max. 58°, min. 38°, mean hourly 48.3°.
Sun Thermometer, max. 140°, 12 M., bright sunshine 11 hrs.
Mean humidity 68.3°, mean force vapor .3648, mean dew point 39.3°.
Wind, W., total movement 90 m., mean hourly vel. 3.7 m., max. pressure 4 1-2 lbs., 3 P. M.

3. Barometer reduced to 32° F., max. 29.589, min. 29.523, mean 29.566.
Temperature, max. 54°, min. 44°, mean hourly 48.5°.
Sun Thermometer, max. 131°, 12-30 P. M., bright sunshine 9 hrs.
Mean humidity 74.3°, mean force vapor .3447, mean dew point 40.3°.
Wind, N. NW., total movement 114 m., mean hourly vel. 4.7 m., max. pressure 3 1-2 lbs, 1-30 P. M., Ozone 1.

4. Barometer reduced to 32° F., max. 29.668, min. 29.589, mean 29.619.
Temperature, max. 63°, min. 40°, mean hourly 52.7°.
Sun Thermometer, max. 136°, 9 A. M., bright sunshine 11 hrs.

Mean humidity 63.3°, mean force vapor .4301, mean dew point 40.6°.
Wind, N. NW., total movement 93 m., mean hourly vel. 3.9 m., max. pressure 3 3-4 lbs., 3 P. M., Ozone 6.

5. Barometer reduced to 32° F., max. 29.695, min. 29.582, mean 29.638.
Temperature, max. 77°, min. 45°, mean hourly 62.7°.
Sun Thermometer, max. 149°, 11-30 A. M., bright sunshine, 10 hrs.
Mean humidity 60°, mean force vapor .6214, mean dew point 49.3°.
Wind, N.W., total movement 130 m., mean hourly vel. 5.4 m., max. pressure 4 3-4 lbs., 12-30 P. M., Ozone 6.

6. Barometer reduced to 32° F., max. 29.717, min. 29.636, mean 29.681.
Temperature, max. 83°, min. 54°, mean hourly 68°.
Sun Thermometer, max. 155°, 2 P. M., bright sunshine 11 hrs.
Mean humidity 56°, mean force vapor .6570, mean dew point 49.3°.
Wind, W., total movement 94 m., mean hourly vel. 3.9 m., max. pressure 1 3-4 lbs., 7 P. M., Ozone 6.

7. Barometer reduced to 32° F., max. 29.786, min. 29.594, mean 29.691.
Temperature, max. 82°, min. 49°, mean hourly 65°.
Sun Thermometer, max. 160°, 2 P. M., bright sunshine, 14 hrs.
Mean humidity 68°, mean force vapor .6690, mean dew point 53.0°.
Wind, S. SW., total movement 72 m., mean hourly vel. 3 m., max. pressure 2 lbs., 7 P. M., Ozone 6.

8. Barometer reduced to 32° F., max. 29.657, min. 29.559, mean 29.636.
Temperature, max. 82°, min. 52°, mean hourly 65.5°.
Sun Thermometer, max. 161°, 2 P. M., bright sunshine 14 hrs.
Mean humidity 65°, mean force vapor .6922, mean dew point 53.6°.
Wind, S., total movement 109 m., mean hourly vel. 4.5 m., max. pressure 1 1-4 lbs., 8-30 P. M., Ozone 6.

9. Barometer reduced to 32° F., max. 29.677, min. 29.496, mean 29.584.
Temperature, max. 88°, min. 55°, mean hourly 71.3°.
Sun Thermometer, max. 162°, 2 P. M., bright sunshine 13 hrs.
Mean humidity 60.6°, mean force vapor .9358, mean dew point 60.3°.
Wind, SW., total movement 110 m., mean hourly vel. 4.5 m., max. pressure 1 1-4 lbs., 4 P. M. Ozone 4.

10. Barometer reduced to 32° F., max. 29.562, min. 29.255, mean 29.376.
Temperature, max. 86°, min. 62°, mean hourly 71.2°.
Sun Thermometer, max. 163°, 12 M., bright sunshine 10 hrs.
Mean humidity 83.6°, mean force vapor .7113, mean dew point 64.0°.
Wind, S., total movement 145 m., mean hourly vel. 6 m., max. pressure 4 lbs., 5-30 P. M., Ozone 3.
Rain began about 2 P. M., ended about 3 P. M., .09 in. water fell.

11. Barometer reduced to 32° F., max. 29.410, min. 29.266, mean. 29.330.
Temperature, max. 74°, min. 59°, mean hourly 65.3°.
Sun Thermometer, max. 144°, 1 P. M., bright sunshine 11 hrs.
Mean humidity 66°, mean force vapor .6205, mean dew point 52.6°.
Wind, N., total movement 83 m., mean hourly vel. 3.5 m., max. pressure 3 lbs., 4-30 P. M., Ozone 7.
Rain began about 7-30 A. M., ended about 1 P. M., .04 in. water fell.

12. Barometer reduced to 32° F.,, max. 29.496, min. 29.410, mean, 29.467.
Temperature, max. 75°, min. 54°, mean hourly 65.2°.
Sun Thermometer, max. 142°, 10 A. M., bright sunshine 9 hrs.
Mean humidity 61°, mean force vapor .6619, mean dew point 53.0°.
Wind, SW., total movement 55 m., mean hourly vel. 2.3 m., max. pressure 1-4, lbs., 7 P. M., Ozone 6.

13. Barometer reduced to 32° F., max. 29.654, min. 29.497, mean 29.594.
Temperature, max. 74°, min. 52°, mean hourly 63.3°.
Sun Thermometer, max. 137°, 11 A. M., bright sunshine 10 hrs.
Mean humidity, 75.3°, mean force vapor .6010, mean dew point 54.0°.
Wind, SE., total movement 165 m., mean hourly vel. 6.9 m., max. pressure 5 lbs., 4 P. M., Ozone 6.
Rain began about 7-45 P. M., rained more or less all night.

14. Barometer reduced to 32° F., max. 29.542, min. 29.360, mean 29.441.
Temperature, max. 74°, min. 57°, mean hourly 61.5.
Sun Thermometer, max. 105°, 2-45 P. M., bright sunshine 9 hrs.
Mean humidity, 91.6°, mean force vapor .5867, mean dew point 60,6°.
Wind, W. SW., total movement 77 m., mean hourly vel. 3.2 m., max. pressure 1 1-2 lbs., 3 P. M., Ozone 6.
Rain at times all day.

15. Barometer reduced to 32° F., max. 29.703, min. 29.439, mean 29.611.
Temperature, max. 74°, min. 57°, mean hourly 65.2°.
Sun Thermometer, max. 137°, 11 A. M., bright sunshine 12 hrs.
Mean humidity, 73.3°, mean force vapor .6184, mean dew point 55.3°.
Wind, N., total movement 68 m., mean hourly vel. 2.8 m., max. pressure 1-2 lbs., 9-15 A. M., Ozone 9.
Rain. stopped at about 12 P. M., .37 in. water fell.

16. Barometer reduced to 32° F., max. 29.800, min. 29.703, mean 29.739.
Temperature, max. 78°, min. 54°, mean hourly 65.2°.
Sun Thermometer, max. 126°, 1 P. M., bright sunshine 8 hrs.
Mean humidity 76°, mean force vapor .6606, mean dew point 58.6°.
Wind W.SW., total movement 128 m., mean hourly vel. 35. m., max. pressure 3 1-2 lbs., 3 1-5 P. M., Ozone 2.

17. Barometer reduced to 32° F., max. 27.935, min. 29.800, mean 29.895.
Temperature, max. 82°, min. 58°, mean hourly 73.°.
Sun Thermometer, max. 132°, 11 A. M., bright sunshine 10 hrs.
Mean humidity 76°, mean force vapor .7637, mean dew point 61.6°.
Wind, W.SW., total movement 189 m., mean hourly vel. 7.9 m., max. pressure 6 3-4 lbs., 3 P. M., Ozone 6.

18. Barometer reduced to 32° F., max. 30.091, min. 29.929, mean 29.954.
Temperature, max. 88°, min. 60°, mean hourly 72.6°.
Sun Thermometer, max. 144°, 10 A. M., bright sunshine 9 hrs.
Mean humidity 69.3°, mean force vapor .8656, mean dew point 63.3°.
Wind, SW,, total movement 155 m., mean hourly vel. 6.4 m., max. pressure 3 lbs., 4-30 P. M., Ozone 6.

19. Barometer reduced to 32° F., max. 29.991, min. 29.845, mean 29.916.
Temperature, max. 78°, min. 58°, mean hourly 67.6°.
Sun Thermometer, max. 135°, 1 P. M., bright sunshine 9 hrs.
Mean humidity 79.3°, mean force vapor .7107, mean dew point 62.3°.
Wind, SW., total movement 109 m., mean hourly vel 4.5 m., max. pressure 5 lbs., 4-30 P. M., Ozone 7.

20. Barometer reduced to 32° F., max. 29.869, min. 29.518, mean 29.656.
Temperature, max. 73°, min. 66°, mean hourly 68.2°.
Sun Thermometer, max. 120°, 1 P. M., bright sunshine 1 hr.
Mean humidity, 92.3°, mean force vapor .7029, mean dew point 66.3°.
Wind, S. SW., total movement 180 m., mean hourly vel. 7.5 m. max. pressure 3 1-4 lbs., 9 P. M., Ozone 6.
Rain, began 3 A. M., rained more or less all day.

21. Barometer reduced to 32° F., max. 29.518, min. 29.268, mean 29.350.
Temperature, max. 72°., min. 60°, mean hourly 67.2°.
Sun Thermometer, max. 100°, 11 A. M., bright sunshine 6 hrs.
Mean humidity, 91.6°, mean force vapor .6459, mean dew point 64.0°.
Wind, S., total movement 159 m., mean hourly vel. 6.6 m., max. pressure   Ozone 9.
Rain stopped about 4 P. M., 2.82 in. water fell.

22. Barometer reduced to 32° F., max. 29.468, min. 29.297, mean 29.413.
Temperature, max. 65°, min. 52°, mean hourly 58.7°.
Sun Thermometer, max. 132°, 12 M., bright sunshine 7 hrs.
Mean humidity, 68.3°, mean force vapor .4988, mean dew point 48.0°.
Wind, NE., total movement 69 m., mean hourly vel. 4 m., max. pressure 1 lb., 10-30 A. M., Ozone 9.

23. Barometer reduced to 32° F., max. 29.563, min. 29.468, mean 29.529.
Temperature, max. 66°, min. 47°, mean hourly 56.2°.

Sun Thermometer, max. 115°, 1 P. M., bright sunshine 7 hrs.
Mean humidity, 76.3°, mean force vapor .4624, mean dew point 48.6°.
Wind, N. NE., total movement 234 m., mean hourly vel. 9.7 m., max. pressure 8 lbs., 1-30 P. M., Ozone 2.

24. Barometer reduced to 32° F., max. 29.567, min. 29.501, mean 29.532.
Temperature, max. 66°, min. 46°, mean hourly 57.7°.
Sun Thermometer, max. 110°, 11 A. M., bright sunshine 4 hrs.
Mean humidity, 74.6°, mean force vapor .5014, mean dew point 51.0°.
Wind, SW., total movement 81 m., mean hourly vel. 3.3 m., max. pressure 2 1-2 lbs., 4 P. M., Ozone 1.
Thunder storm in night, .37 in. water fell.

25. Barometer reduced to 32° F., max. 29.648, min. 29.517, mean 29.577.
Temperature, max. 67°, min. 52°, mean hourly 58.5°.
Sun Thermometer, max. 122°, 11 A. M., bright sunshine 11 hrs.
Mean humidity 67.3°, mean force vapor .5172, mean dew point 48.3°.
Wind, N., total movement 137 m., mean hourly vel. 5.8 m., max. pressure 4 lbs., 9-30 A. M., Ozone 5.

26. Barometer reduced to 32° F., max. 29.786, min. 29.648, mean 29.740.
Temperature, max. 52°, min. 44°, mean hourly 48.2°.
Sun Thermometer, max. 49°, 3 P. M., bright sunshine 0.
Mean humidity 89.3°, mean force vapor .3270, mean dew point 44.3°.
Wind, N.NE., total movement 125 m., mean hourly vel. 5.2 m., max. pressure 1 1-2 lbs., 1-30 A. M., Ozone 4.
Rain began night of 25th, ended 9 A. M., .3 in. water fell.
Frost on low lands, on the morning of the 27th.

27. Barometer reduced to 32° F., max. 29.798, min. 29.518, mean 29.675.
Temperature, max. 53°, min. 48°, mean hourly 49.8°.
Sun Thermometer, max. 70°, 9 A. M., bright sunshine 1 hr.
Mean humidity 91.6°, mean force vapor .3514, mean dew point 47.0°.
Wind, S.SE., total movement 131 m., mean hourly vel. 5.4 m., max. pressure 2 lbs., 8-30 A. M., Ozone 5.
Rain 11-30 A. M. and showered more or less all day, .54 in. water fell.

28. Barometer reduced to 32° F., max. 29.684, min. 29.411, mean 29.469.
Temperature, max. 70°, min. 46°, mean hourly 57.3°.
Sun Thermometer, max. 114°, 2 P. M., bright sunshine 11 hrs.
Mean humidity 74.°, mean force vapor .4981, mean dew point 49.6°.
Wind, W.SW., total movement 170 m., mean hourly vel. 7 m., max. pressure 5 1-4 lbs., 3-30 P. M., Ozone 6.

29. Barometer reduced to 32° F., max. 29.897, min. 29.684, mean 29.853.
Temperature, max. 67°, min. 41°, mean hourly 53.7°.
Sun Thermometer, max. 125°, 1 P. M., bright sunshine 14 hrs.
Mean humidity 76.6°, mean force vapor .4367, mean dew point 47.0°.
Wind, N., total movement 121 m., mean hourly vel. 5 m., max. pressure 3 lbs., 7 A. M., Ozone 2.

30. Barometer reduced to 32° F., max. 29.913, min. 29.849, mean 29.874.
Temperature, max. 66°, min. 46°, mean hourly 57.2°.
Sun Thermometer, max. 76°, 2 P. M., bright sunshine 3 hrs.
Mean humidity 82.°, mean force vapor .4478, mean dew point 53.6°.
Wind, N.NW., total movement 92 m., mean hourly vel. 3.8 m., max. pressure 6 1-2 lbs., 11-30 P. M., Ozone 6.
Rain, began 11-30 A. M. and showered during P. M., .12 in. water fell.

31. Barometer reduced to 32° F., max. 29.842, min. 29.763, mean 29.800.
Temperature, max. 76°, min. 65°, mean hourly 69.7°.
Sun Thermometer, max. 121°, 12 M., bright sunshine 5 hrs.
Mean humidity 77°, mean force vapor .7543, mean dew point 64.0°.
Wind, S.SW., total movement 405 m., mean hourly vel. 16.8 m., max. pressure 9 lbs., 2-30 P. M., Ozone 6.
Rain, showered all day, .06 in. water fell.

C. D. WARNER, Meteorologist.

BULLETIN No. 6. JUNE, 1889.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.240; Mean reduced to 32° F., 29.670; Monthly Range, .991.

Air Temperature. In Degrees Fahrenheit. Mean, 67.7°; Highest, 90.0°; Lowest, 46.0°; Monthly Range, 44.0°; Highest Mean Daily, 77.9°; Lowest Mean Daily, 56.5°; Mean Maximum, 76.0°; Mean Minimum, 59.7°; Mean Daily Range, 15.9°; Greatest Daily Range, 25.0°.

Humidity. Mean Dew Point, 61.1°; Mean Relative Humidity, 79.1°; Mean Force of Vapor, .7072.

Wind. Prevailing Direction, S.; Total Movement, 4056 miles; Greatest Daily Movement, 485 miles, 1st; Least Daily Movement, 28 miles, 24th; Mean Daily Movement, 135.8 miles, Mean Hourly Velocity, 5.6 miles; Maximum Pressure per Square Foot, 11 1-2 lbs. =47.9 m. per hour, 1st, at 7 A. M.

Precipitation. In inches. Total Precipitation, 5.01.

Bright Sunshine. Number of Hours Recorded, 277.

Weather. Mean Cloudiness, on a Scale of 10, 5.3; Number of Clear Days, 3.; Number of Cloudy Days, 7; Number of Fair Days, 20; Total Cloudiness recorded by the Sun Thermometer, 173 hrs, or 38.6 per cent.

Thunder and Lightning, 10th, 11th, 15th, 16th and 28th.

Halo, Solar, 3d, 11-20 A. M.

DAILY SUMMARY.

JUNE 1. Barometer reduced to 32° F., max. 29.797, min. 29.628, mean 29.671.
Temperature, max. 73°, min. 64°, mean hourly 68.7°.
Sun Thermometer, max. 97°, 10 A. M., bright sunshine 3 hrs.
Mean humidity 88.3°, mean force vapor .7091, mean dew point 65.3.°
Wind, S., total movement, 485 m., mean hourly velocity 20.2 m., max. pressure, 11 1-2 lbs., 10 A. M. ozone 3, showers during day, 1.54 in. rain fell.

2. Barometer reduced to 32° F., max. 29.687, min. 29.623, mean 29.656.
Temperature, max. 74°, min. 63°, mean hourly 67.1°.
Sun Thermometer, max. 93°, 12 M., bright sunshine 5 hrs.
Mean humidity 83°, mean force vapor .6739, mean dew point 61.6°.
Wind, S. SW., total movement 183 m., mean hourly vel. 7.6 m., max. pressure 5 3-4 lbs., 2.15 P. M., Ozone 2.

3. Barometer reduced to 32° F., max. 29.705, min. 29.580, mean 29.638.
Temperature, max. 75°, min. 60°, mean hourly 66.3°.
Sun Thermometer, max. 107°, 12 M., bright sunshine 11 hrs.
Mean humidity 78.6°, mean force vapor .6697, mean dew point 59.6°.
Wind, S. SW., total movement 105 m., mean hourly vel. 4.3 m., max. pressure 1-2 lb, 2 P. M., Ozone 3.
Solar halo about 11.20 A. M.

4. Barometer reduced to 32° F., max. 29.580, min. 29.282, mean 29.376.
Temperature, max. 73°, min. 59°, mean hourly 65°.
Sun Thermometer, max. 94°, 12 M.. bright sunshine 7 hrs.

Mean humidity 84°, mean force vapor .6302, mean dew point 56.6°.
Wind, N., total movement 71 m., mean hourly vel. 2.9 m., max. pressure 0, Ozone 2.
Rain began 2.45 P. M., ended 3.45 P. M., .04 in. fell.

5. Barometer reduced to 32° F., max. 29.282, min. 29.183, mean 29.227.
Temperature, max. 69°, min. 59°, mean hourly 63.8°.
Sun Thermometer, max. 140°, 1 P. M., bright sunshine, 11 hrs.
Mean humidity 75.3°, mean force vapor .5901, mean dew point 55.3°.
Wind, NW., total movement 147 m., mean hourly vel. 6.1 m., max. pressure 4 lbs., 10-30 A. M., Ozone 2.
Light showers during the day.

6. Barometer reduced to 32° F., max. 29.461, min. 29.225, mean 29.323.
Temperature, max. 60°, min. 51°, mean hourly 56.5°.
Sun Thermometer, max. 135°, 10 A. M., bright sunshine 10 hrs.
Mean humidity 81.3°, mean force vapor .4553, mean dew point 50.3°.
Wind, NW., total movement 124 m., mean hourly vel. 5.1 m., max. pressure 6 3-4 lbs., 11 A. M., Ozone 1.
Rain began early morn, ended 8 A. M., .06 in. water fell.

7. Barometer reduced to 32° F., max. 29.598, min. 29.461., mean 29.551
Temperature, max. 72°, min. 47°, mean hourly 60.5°.
Sun Thermometer, max. 147°, 2 P. M., bright sunshine, 14 hrs.
Mean humidity 61.6°, mean force vapor .5715, mean dew point 47.6°.
Wind, S. SW., total movement 123 m., mean hourly vel. 5.1 m., max. pressure 2 1-2lbs., 7.45 P. M., Ozone 1.
Light showers.

8. Barometer reduced to 32° F., max. 29.612, min. 29.509, mean 29.548.
Temperature, max. 64°, min. 59°, mean hourly 61.8°.
Sun Thermometer, max. 77°, 1 P. M., bright sunshine 1 hr.
Mean humidity 96°, mean force vapor .5554, mean dew point 60.6°.
Wind, S. SW, total movement 217 m., mean hourly vel. 9 m., max. pressure 3-4 lbs., 11 A. M., Ozone 1.
Rain ended 6 P. M, .62 in fell.

9. Barometer reduced to 32° F., max. 29.691, min. 29.612, mean 29.651.
Temperatnre, max. 80°, min. 62°, mean hourly 69.7°.
Sun Thermometer, max. 131°, 10 A. M., bright sunshine 9 hrs.
Mean humidity 90.6°, mean force vapor .7512, mean dew point 67.3°.
Wind, SW., total movement 118 m., mean hourly vel. 4.9 m., max. pressure 2 1-2 lbs., 8 P. M., Ozone 4.
Rain began 8.45 A. M., light showers, .03 in. fell.

10. Barometer reduced to 32° F., max. 29.729, min. 29.649, mean 29.696.
Temperature, max. 81°, min. 68°, mean hourly 72°.
Sun Thermometer, max. 142°, 12 M., bright sunshine 9 hrs.
Mean humidity 92°, mean force vapor .8322, mean dew point 71°.
Wind, SW., total movement 196 m., mean hourly vel. 8.1 m., max. pressure 2 lbs., 2 P. M., Ozone 6.
Rain began 3.30 P. M., ended 8 P. M., in showers, .12 in. water fell, accompanied by thunder and lightning.

11. Barometer reduced to 32° F., max. 29.754, min. 29.659, mean. 29.704.
Temperature, max. 81°, min. 67°, mean hourly 72.
Sun Thermometer, max. 146°, 8.30 P. M., bright sunshine 5 hrs.
Mean humidity 87.3°,mean force vapor .7161,mean dew point 68.6°.
Wind, S. SW., total movement 64 m., mean hourly vel. 2.6 m., max. pressure 1 3-4 lbs., 3 P. M., Ozone 4.
Rain began 2.30 P. M., ended 6.30 P. M., 2.10 in. water fell, accompanied by thunder and ligtning.

12. Barometer reduced to 32° F.,, max. 29.839, min. 29.707, mean, 29.815.
Temperature, max. 69°, min. 60°, mean hourly 64.7°.
Sun Thermometer, max. 90°, 7.30 A. M., bright sunshine 2 hrs.
Mean humidity 81.6°, mean force vapor .6189, mean dew point 59°.
Wind, N., total movement 100 m., mean hourly vel. 4.1 m., max. pressure 3-4, lbs., 3.15 A. M., Ozone 6.
Rain began 1.15 P. M., ended 7.30 P. M. in showers, .04 in. fell.

13. Barometer reduced to 32° F., max. 29.825, min. 29.645, mean 29.737.
Temperature, max. 79°, min. 58°, mean hourly 68.1°.
Sun Thermometer, max. 127°, 1 P. M., bright sunshine 11 hrs.
Mean humidity, 82.3°, mean force vapor .7353, mean dew point 63.3°.
Wind, SW., total movement 123 m., mean hourly vel. 5.1 m., max. pressure 2 lbs., 3.15 P. M., Ozone 3.

14. Barometer reduced to 32° F., max. 29.821, min. 29.757, mean 29.795.
Temperature, max. 84°, min. 65°, mean hourly 73.5.
Sun Thermometer, max. 133°; 10 A. M., bright sunshine 9 hrs.
Mean humidity, 77.0°, mean force vapor .8463, mean dew point 65°.
Wind, W. SW.,total movement 117 m.,mean hourly vel. 4.8 m., max. pressure 1 1-2 lbs., 1.30 P. M., Ozone 2.

15. Barometer reduced to 32° F., max. 29.811, min. 29.629, mean 29.689.
Temperature, max. 81°, min. 66°, mean hourly 72°.
Sun Thermometer, max. 129.0°, 2 P. M., bright sunshine 10 hrs.
Mean humidity, 91.6°, mean force vapor .7074, mean dew point 69.6°.
Wind, SW., total movement 179 m., mean hourly vel. 8.4 m., max. pressure 6 lbs., 2.30 P. M., Ozone 4.
Rain, begain 3.15 P. M., showers, .17 in. fell, accompanied by thunder and lightning.

16. Barometer reduced to 32° F., max. 29.733, min. 29.525, mean 29.646.
Temperature, max. 82°, min. 65°, mean hourly 73.7°.
Sun Thermometer, max. 142°, 10 A. M., bright sunshine 11 hrs.
Mean humidity 82.6°, mean force vapor .8689, mean dew point 69°.
Wind SW., total movement 94 m., mean hourly vel. 3.9. m., max. pressure 2 lbs., 2 P. M., Ozone 4.
Light showers, accompanied by thunder and lightning.

17. Barometer reduced to 32° F., max. 29.660 min. 29.403, mean 29.477.
Temperature, max. 73°, min. 59°, mean hourly 68.3°.
Sun Thermometer, max. 103°, 9 A. M., bright sunshine 3 hrs.
Mean humidity 93.3°, mean force vapor .6691, mean dew point 65.6°.
Wind, E.NE., total movement 107 m., mean hourly vel. 4.4 m., max. pressure 1 3-4 lbs., 10.30 P. M., Ozone 3.
Rain began 6.45 A. M., ended 3 P. M., showers, .15 in. water fell.

18. Barometer reduced to 32° F., max. 29.784, min. 29.660, mean 29.761.
Temperature, max. 69°, min. 53°, mean hourly 60°.
Sun Thermometer, max. 126°, 2 P. M., bright sunshine 13 hrs.
Mean humidity 66.6°, mean force vapor .5324, mean dew point 49.3°.
Wind, SE,, total movement 155 m., mean hourly vel. 6.4 m., max. pressure 2 lbs., 1-30 P. M., Ozone 6.

19. Barometer reduced to 32° F., max. 29.784, min. 29.477, mean 29.605.
Temperature, max. 71°, min. 46°, mean hourly 60.5°.
Sun Thermometer, max. 131°, 10 A. M., bright sunshine 12 hrs.
Mean humidity 75.3°, mean force vapor .5695, mean dew point 54°.
Wind, SE., total movement 99 m., mean hourly vel 4.1 m., max. pressure 1 lb., 7 P. M., Ozone 6.

20. Barometer reduced to 32° F., max. 29.603, min. 29.350, mean 29.459.
Temperature, max. 79°, min. 60°, mean hourly 70.3°.
Sun Thermometer, max. 124°, 12 M., bright sunshine 11 hrs.
Mean humidity, 77°, mean force vapor .7812, mean dew point 63.6°.
Wind, S. , total movement 165 m., mean hourly vel. 5 m. max. pressure 11 lbs., 8.30 A. M., Ozone 2.

21. Barometer reduced to 32° F., max. 29.675, min. 29.425, mean 29.556.
Temperature, max.81 °., min. 58°, mean hourly 71.6°.
Sun Thermometer, max. 131°, 10 A. M., bright sunshine 10 hrs.
Mean humidity, 71.6°, mean force vapor .8204, mean dew point 62.3°.
Wind, S.SW,, total movement 127 m., mean hourly vel. 5.2 m., max. pressure 4 lbs., 4 P. M., Ozone 1.

22. Barometer reduced to 32° F., max. 29.660, min. 29.381, mean 29.491.
Temperature, max. 74°, min. 59°, mean hourly 68.0°.
Sun Thermometer, max. 122°, 9 A. M., bright sunshine 9 hrs.
Mean humidity, 69.6°, mean force vapor .6765, mean dew point 56.3°.

Wind, W. NW., total movement 223 m., mean hourly vel. 9.2 m., max. pressure 8 lbs., 1 P. M., Ozone 3.
Rain began 6.45 A. M., stopped 7.15 P. M., .02 in fell,

23. Barometer reduced to 32° F., max. 30.031, min. 29.660, mean 29.855.
Temperature, max. 71°, min, 55°, mean hourly, 62.8°
Sun Thermometer, max. 119°, 12-30 P. M., bright sunshine 11 hrs.
Mean humidity, 61°, mean force vapor .5931, mean dew point 49.6°.
Wind, W. NW., total movement 144 m., mean hourly vel. 6 m., max. pressure 3 1-2 lbs., 10-30 A. M., Ozone 1.

24. Barometer reduced to 32° F., max. 30.144, min. 30.031, mean 30.110.
Temperature, max. 75°, min. 50°, mean hourly 63.1°.
Sun Thermometer, max. 120°, 1 P. M., bright sunshine 14 hrs.
Mean humidity, 66.6°, mean force vapor .6191, mean dew point 52.3°.
Wind, N. NW., total movement 28 m., mean hourly vel. 1.1 m., max. pressure 0—; Ozone 2.

25. Barometer reduced to 32° F., max. 30.174, min. 30.047, mean 30.092.
Temperature, max. 75°, min. 52°, mean hourly 63.8°.
Sun Thermometer, max. 122°, 1 P. M., bright sunshine 13 hrs.
Mean humidity 71.3°, mean force vapor .6354, mean dew point 51.3°.
Wind, W. SW., total movement 64 m., mean hourly vel. 2.6 m., max. pressure 3-4 lbs., 2 P. M., Ozone 1.

26. Barometer reduced to 32° F., max. 30.047, min. 29.759, mean 29.892.
Temperature, max. 74°, min. 60°, mean hourly 65.5°.
Sun Thermometer, max. 95°, 2 P. M., bright sunshine 3 hrs.
Mean humidity 81.3°, mean force vapor .6361, mean dew point 60°.
Wind, SW., total movement 200 m., mean hourly vel. 8.3 m., max. pressure 5 3-4 lbs., 8-30 A. M., Ozone 1.
Showers during day, .05 in. water fell.

27. Barometer reduced to 32° F., max. 29.769, min. 29.632, mean 29.755.
Temperature, max. 80°, min. 68°, mean hourly 73.1°.
Sun Thermometer, max. 118°, 9-30 A. M., bright sunshine 9 hrs.
Mean humidity 84°, mean force vapor .8355, mean dew point 72°.
Wind, W.SW., total movement 157 m., mean hourly vel. 6.5 m., max. pressure 2 1-2 lbs., 0 A. M., Ozone 4.
Very light showers during day.

28. Barometer reduced to 32° F., max. 29.831, min. 29.723, mean 29.779.
Temperature, max. 87°, min. 67°, mean hourly 75.4°.
Sun Thermometer, max. 144°, 2 P. M., bright sunshine 14 hrs.
Mean humidity 77.°, mean force vapor .9192, mean dew point 67.6°.
Wind, W.SW., total movement 54 m., mean hourly vel. 2.2 m., max. pressure 0—; Ozone 1.
Rain began at 7-40 P. M. ended at 7-50, .07 in. water fell. Thunder and lightning.

29. Barometer reduced to 32° F., max. 29.817, min. 29.706, mean 29.765.
Temperature, max. 88°, min. 66°, mean hourly 75.9°.
Sun Thermometer, max. 115°, 12-15 P. M., bright sunshine 14 hrs.
Mean humidity 74.3°, mean force vapor .9293, mean dew point 67.3°.
Wind, SW., total movement 31 m., mean hourly vel. 1.2 m., max. pressure 0—; Ozone 4.

30. Barometer reduced to 32° F., max. 29.855, min. 29.736, mean 29.795.
Temperature, max. 90°, min. 67°, mean hourly 77.9°.
Sun Thermometer, max. 111°, 12-15 P. M., bright sunshine 2 hrs.
Mean humidity 73.3°, mean force vapor .9687, mean dew point 68°.
Wind, SW., total movement 56 m., mean hourly vel. 2.3 m., max. pressure 0—; Ozone 6.

C. D. WARNER, Meteorologist.

BULLETIN No. 7. JULY, 1889.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.070; actual minimum reading 29.380; Mean reduced to 32° F., 29.619; Monthly Range, .690.

Air Temperature. In Degrees Fahrenheit. Highest, 84.0°; Lowest, 54.0°; Mean, 69.5°; Monthly Range, 30.0°; Highest Mean Daily, 75.2°; Lowest Mean Daily, 60.3°; Mean Maximum, 77.1°; Mean Minimum, 62.0°; Mean Daily Range, 15.2°; Greatest Daily Range, 28.0°.

Humidity. Mean Dew Point, 62.7°; Mean Force of Vapor, .5892; Mean Relative Humidity, 78.2°.

Wind. Prevailing Direction, SW.; Total Movement, 4032 miles; Greatest Daily Movement, 272 miles, 3rd; Least Daily Movement, 45 miles, 7th; Mean Daily Movement 130 miles, Mean Hourly Velocity, 5.4 miles; Maximum Pressure per Square Foot, 10 lbs. =45.0 m. per hour, 19th, at 11 P. M.

Precipitation. In inches. Total Precipitation, 7.55; at base of tower 9.09 in.

Weather. Mean Cloudiness, on a Scale of 10, 5.4; Number of Clear Days, 8.; Number of Cloudy Days, 18; Number of Fair Days, 5; Total Cloudiness recorded by the Sun Thermometer, 265 hrs, or 59.3 per cent. Number of days on which .01 or more rain fell 15. Winds followed by rain 29th.

Bright Sunshine. Number of Hours Recorded, 182.

Thunder and Lightning, 7th, 8th, 23rd, 29th and 30th.

Meteors, 18th.

DAILY SUMMARY.

JULY 1. Barometer reduced to 32° F., max. 29.945, min. 29.858, mean 29.918.
Temperature, max. 84°, 4 P. M., min. 71°, 5 A. M., mean hourly 76.3°.
Sun Thermometer, max. 107°, 11 A. M., bright sunshine 12 hrs.
Mean dew point 70.6°, mean force vapor .7497, mean humidity 82.3°.
Wind, SW., total movement, 105 m., mean hourly velocity 3.9 m., max. pressure, 3-4 lbs.=12 m. per hour, 4 P. M. Ozone 2.

2. Barometer reduced to 32° F., max. 29.946, min. 29.839, mean 29.893.
Temperature, max. 75°, 12 M., min. 70°, 4 A. M., mean hourly 72.6°.
Sun Thermometer, max. 83°, 11 A. M., bright sunshine 2 hrs.
Mean dew point 68.6°, mean force vapor .6995, mean humidity 86.3°.
Wind, S., total movement 155 m., mean hourly vel. 5.5 m., max. pressure 2 1-2 lbs.,=22 m. per hour, 2-45 P. M. Showers afternoon and night, .8 in. water fell, at base of tower 1.01 in. Ozone 1.

3. Barometer reduced to 32° F., max. 29.839, min. 29.568, mean 29.680.
Temperature, max. 76°, 3 P. M., min. 69°, 3 A. M., mean hourly 71.9°.
Sun Thermometer, max. 57°, 11 A. M., bright sunshine 0 hrs.
Mean dew point 71.0°, mean force vapor .7576, mean humidity 95.6°.
Wind, SW., total movement 272 m., mean hourly vel. 11.3 m., max. pressure 3 1-2 lbs,=26 m. per hour, 10-30 P. M. Showers ended 12 M. .05 in. water fell, at base of tower .03 in. Ozone 5,

4\. Barometer reduced to 32° F., max. 29.609, min. 29.481, mean 29.543.
Temperature, max. 73°, 10 A. M., min. 63°, 12 P. M., mean hourly 68.3°.
Sun Thermometer. max. 48°, 11 A. M., bright sunshine 0 hrs.
Mean dew point 66°, mean force vapor .6408, mean humidity 97.3°.
Wind. SW., total movement 190 m., mean hourly vel. 7.9 m., max. pressure 3 lbs.=24 m. per hour, 1-30 A. M. Rainy P. M., .44 in. water fell, at base of tower .64 in. Ozone 5.

5\. Barometer reduced to 32° F., max. 29.810, min. 29.609, mean 29.705.
Temperature. max. 76°, 3 P. M., min. 58°, 4 A. M., mean hourly 67.1°.
Sun Thermometer, max. 99°, 9 A. M., bright sunshine, 14 hrs.
Mean dew point 58.0°, mean force vapor .4820. mean humidity 71.3°.
Wind, N. NE., total movement 177 m., mean hourly vel. 73.7 m., max. pressure 7 1-4 lbs..=38 m. per hour, 12-30 P. M. Ozone 7.

6\. Barometer reduced to 32° F., max. 29.905, min. 29.810, mean 29.860.
Temperature, max. 82°, 4 P. M., min. 58°, 5 A. M., mean hourly 69.8°.
Sun Thermometer, max. 111°. 10 A. M., bright sunshine 11 hrs.
Mean dew point 60°, mean force vapor .4820, mean humidity 70.6°.
Wind. N. NE., total movement 86 m., mean hourly vel. 3.6 m., max. pressure 0. Ozone 5.

7\. Barometer reduced to 32° F., max. 29.859, min. 29.669., mean 29.764
Temperature, max. 81°, 1 P. M.. min. 59°, 5 A. M., mean hourly 74.3°.
Sun Thermometer. max. 116°, 12 M., bright sunshine. 8 hrs.
Mean dew point 64°, mean force vapor .5996, mean humidity 75.6°.
Wind. NE., total movement 15 m., mean hourly vel. 1.9 m., max. pressure 0. Shower 10 min. at 2.40 P. M., .03 in. water; at base of tower .03 in. Ozone 1.

8\. Barometer reduced to 32° F., max. 29.669, min. 29.497, mean 29.565.
Temperature, max. 84°, 12 m., min. 66°, 4 A. M., mean hourly 75.2°.
Sun Thermometer, max. 117°, 11 A. M., bright sunshine 7 hrs.
Mean dew point 68°, mean force vapor .6864, mean humidity 73.6°.
Wind. NE., total movement 81 m., mean hourly vel. 3.4 m., max. pressure 4 lbs.=28 m. per hour. 6-30 P. M. Shower, 6-45 to 7-30 A. M., .46 in. water fell; at base of tower .59 in. Ozone 1.

9 Barometer reduced to 32° F., max. 29.725, min. 29.568, mean 29.655.
Temperature, max. 78°, 1 P. M, min. 64°, 12 P. M., mean hourly 70.9°.
Sun Thermometer. max. 116°, 12 M., bright sunshine 2 hrs.
Mean dew point 66.6°, mean force vapor .6535, mean humidity 86.3°.
Wind, S. SE., total movement 79 m., mean hourly vel. 3.3 m., max. pressure 2 lbs.=20 m. per hr., 8-30 P. M. Very light showers began 9 A. M. Ozone 2.

10\. Barometer reduced to 32° F., max. 29.773, min. 29.709, mean 29.740.
Temperature. max. 66°, 2 P. M., min. 61°, 4 A. M., mean hourly 63.4°.
Sun Thermometer, max. 44°, 12 M.. bright sunshine 0.
Mean dew point 60.6°, mean force vapor .5299, mean humidity 91.3°.
Wind, SW., total movement 114 m., mean hourly vel. 48 m., max. pressure 1-2 lb..=10 m. per hour, 0 A. M. Showers ceased 6 A. M., .28 in. water fell; at base of tower, .13 in. Ozone 4.

11\. Barometer reduced to 32° F., max. 29.720, min. 29.548, mean. 29.610.
Temperature, max. 71°, 5 P. M., min. 60°, 5 A. M., mean hourly 65.8°.
Sun Thermometer, max. 52°, 2 P. M., bright sunshine 0.
Mean dew point 61.6°, mean force vapor .6129, mean humidity 95°.
Wind, S.. total movement 123 m., mean hourly vel. 5.1 m., max. pressure 3-4 lb.=12 m. per hour, 5 A. M. Showers during the day, .05 in. water fell: at base of tower, .27 in. Ozone —.

12\. Barometer reduced to 32° F.,. max. 29.657. min. 29.567, mean, 29.608.
Temperature. max. 83°, 3 P. M., min. 63°, 4 A. M., mean hourly 72.5°.
Sun Thermometer, max. 118°, 1 P. M., bright sunshine 12 hrs.
Mean dew point 65°, mean force vapor .6223, mean humidity 75.3°.
Wind. N., total movement 82 m., mean hourly vel. 3.4 m., max. pressure 2 1-2 lbs.=22 m per hour, 11 A. M.. Ozone 6.

13. Barometer reduced to 32° F., max. 29.657, min. 29.450, mean 29.519.
Temperature, max. 83°, 1 P. M., min. 63°, 3 A. M., mean hourly 73°.
Sun Thermometer, max. 110°, 1 P. M. bright sunshine 6 hrs.
Mean dew point 69.6°, mean force vapor .7320, mean humidity, 85.6°.
Wind, SW., total movement 118 m., mean hourly vel. 4.9 m., max. pressure 4 lbs., =28m. per hour, 2.30 P. M., Ozone 1.

14. Barometer reduced to 32° F., max. 29.511, min. 29.421, mean 29.468.
Temperature, max. 81°, 3 P. M., min. 66°, 12 P. M., mean hourly 73.3.
Sun Thermometer, max. 119°, 12 M., bright sunshine 12 hrs.
Mean dew point 63.6°, mean force vapor .5896, mean humidity. 73.6°.
Wind, N. NE., total movement 136 m., mean hourly vel. 5.6 m., max. pressure 3 1-2 lbs., =26 m. per hour, 11 A. M., Ozone 1.

15. Barometer reduced to 32° F., max. 29.535, min. 29.421, mean 29.473.
Temperature, max. 65°, 1 A. M., min. 57°, 11 P. M. mean hourly 60.3°.
Sun Thermometer, max. 37°, 1 P. M., bright sunshine 0.
Mean dew point 566°, mean force vapor .4591, mean humidity, 89°.
Wind, NE., total movement 151 m., mean hourly vel. 6.3 m., max. pressure 4 lbs.=28 m. per hour, 5 P. M.
Showers all day: .97 in. rain fell: at base of tower 1.1 in., Ozone 4.

16. Barometer reduced to 32° F., max. 29.609, min. 29.535, mean 29.565.
Temperature, max. 75°, 6 P. M., min. 54°. 2 A. M. mean hourly 61.9°.
Sun Thermometer, max. 118°, 10 A. M., bright sunshine 4 hrs.
Mean dew point 63.3°, mean force vapor .4905, mean humidity 75.6°.
Wind NW., total movement 133 m., mean hourly vel. 5.5 m, max. pressure 3 1-4 lbs., =26 m. per hour, 3-30 P. M., Ozone 5.

17. Barometer reduced to 32° F., max. 29.627, min. 29.497, mean 29.539.
Temperature, max. 79°, 4 P. M., min. 60°, 12 P. M. mean hourly 69.4°.
Sun Thermometer, max. 112°, 9 A. M., bright sunshine 12 hrs.
Mean dew point 57.6°, mean force vapor .4828, mean humidity 68.3°.
Wind, N., total movement 134 m., mean hourly vel. 5.6m., max. pressure 2 1-4 lbs., =21 m. per hour, 11.30 A. M., Ozone 0.

18. Barometer reduced to 32° F., max. 29.652, min. 29.529, mean 29.590.
Temperature, max. 82°, 4 P. M. min. 54°, 3 A. M. mean hourly 69°.
Sun Thermometer, max. 122°, 11 P. M., bright sunshine 14 hrs.
Mean dew point 58.3°, mean force vapor .4912, mean humidity 66.3°.
Wind, S., total movement 75 m., mean hourly vel. 3.1 m. max. pressure 2 1-2 lbs., =22 m. per hour, 2 P. M., Ozone 0.

19. Barometer reduced to 32° F., max. 29.607, min. 29.376, mean 29.488.
Temperature, max. 80°. 1 P. M., min. 61°, 5 A. M., mean hourly 70.3°.
Sun Thermometer, max. 119°, 12 M., bright sunshine 6 hrs.
Mean dew point 67.3°, mean force vapor .6684, mean humidity 86°.
Wind, SW., total movement 208 m., mean hourly vel 8.6 m. max. pressure 10 lbs., =45 m. per hour. 10-30 P. M.
Rain began 5 P. M., Ozone 5.

20. Barometer reduced to 32° F., max. 29.428, min. 29.273, mean 29.321.
Temperature, max. 83°, 1 P. M. min. 68°. 1 A. M. mean hourly 74.3°.
Sun Thermometer, max. 123°, 1 P. M., bright sunshine 5 hrs.
Mean dew point 70°, mean force vapor .8058, mean humidity, 84.3°.
Wind, N.N.E., total movement 237 m., mean hourly vel. 9.9 m., max. pressure 8 3-4 lbs., =42 m. per hour, 1 P. M.
Rain ended 8 A. M., .99 in. Shower 10-30 A. M., .03 in., Ozone 6.

21 Barometer reduced to 32° F., max. 29.590, min. 29.428, mean 29.514.
Temperature, max. 81°., 3 P. M. min. 66°, 12 P.M., mean hourly 73.4°.
Sun Thermometer, max. 112°, 1P. M., bright sunshine 10 hrs.
Mean dew point 64.6°, mean force vapor .6246, mean humidity, 74.°.
Wind, N.NE,. total movement 130 m., mean hourly vel. 5.4 m., max. pressure 6 lbs., =35 m. per hour, 10 A. M., Ozone 4.

22. Barometer reduced to 32° F., max. 29.657, min. 29.552, mean 29.600.
Temperature, max. 65°, 1 A. M., min. 57°, 12 P. M., mean hourly 60.3°.
Sun Thermometer, max. 125°, 2 P. M., bright sunshine 9 hrs.
Mean dew point 46.3°. mean force vapor .3254, mean humidity, 63.3°.
Wind, S.S.W total movement 73 m., mean hourly vel. 3 m., max. pressure 3-4 lb. =12 m. per hour, 5 P. M., Ozone 2.

23. Barometer reduced to 32° F., max. 29.565, min. 29.325, mean 29.409.
Temperature, max. 75. 6 P. M., min, 54°, 4 A. M., mean hourly, 65.5°.
Sun Thermometer, max. 112°, 10 A. M., bright sunshine 5 hrs.
Mean dew point 54.3°, mean force vapor .4247, mean humidity, 64.3°.
Wind, N., total movement 158 m., mean hourly vel. 6.6 m., max. pressure 6 1-2 lbs.,=36 m. per hour. 3 P. M., Ozone 4.

24. Barometer reduced to 32° F., max. 29.666, min. 29.457, mean 29.569.
Temperature, max. 79°, 4 P. M., min. 60°, 12 P. M., mean hourly 69.5°.
Sun Thermometer, max. 110°, 9 A. M., bright sunshine 4 hrs.
Mean dew point 55°, mean force vapor .4344, mean humidity. 60.6°.
Wind, N., total movement 161 m., mean hourly vel. 6.7 m., max. pressure 7 1-2 lbs.,=39 m. per hour, 1 P. M., Ozone 4.

25. Barometer reduced to 32° F., max. 29.759, min. 29.666, mean 29.711.
Temperature, max. 82°, 4 P. M., min. 54°, 3A. M., mean hourly 69°.
Sun Thermometer, max. 120°, 10 A. M., bright sunshine 12 hrs.
Mean dew point 56°, mean force vapor .4526, mean humidity 60.6°.
Wind, NW., total movement 66 m., mean hourly vel. 2.8 m., max. pressure 3-4 lbs.,=12 m. per hour, 4 P. M., Ozone 2.

26. Barometer reduced to 32° F., max. 29.797, min. 29.723, mean 29.763.
Temperature, max. 80°, 1 P. M., min. 61°, 5A. M., mean hourly 70.3°.
Sun Thermometer, max. 121°, 12 M., bright sunshine 11 hrs.
Mean dew point 57.3°, mean force vapor .4709, mean humidity 61.6°.
Wind, SW., total movement 92 m., mean hourly vel. 3.9 m., max. pressure 1 1-4 lbs.,=17 m, per hour, 6 P. M., Ozone 3.

27. Barometer reduced to 32° F., max. 29.764, min. 29.544, mean 29.617.
Temperature, max. 70°, 8 A.M., min. 59°, 10 P.M., mean hourly 63.8°.
Sun Thermometer, max. 70°, 4 P. M., bright sunshine 0.
Mean dew point 58.6°, mean force vapor .4968, mean humidity 85.3°.
Wind, N. NE., total movement 142 m., mean hourly vel. 5.9 m., max. pressure 1 3-4 lbs.=19 m. per hour 4 P. M. Rain more or less all day, 1.15 in. water fell; at base of tower, 1.86 in. Ozone 5.

28. Barometer reduced to 32° F., max. 29.648, min. 29.587, mean 29.628.
Temperature, max. 71°, 1 P. M., min. 60°, 1 A.M., mean hourly 65.5°.
Sun Thermometer, max. 91°, 1 P. M., bright sunshine 0.
Mean dew point 59.0°, mean force vapor .5014, mean humidity 75.6°.
Wind, S. SW., total movement 90 m., mean hourly vel. 3.7 m., max. pressure 1 lb.=14 m. per hour, 6 P. M. Inappreciable shower, 5 P. M. Ozone 6.

29. Barometer reduced to 32° F., max. 29.669, min. 29.522, mean 29.611.
Temperature, max. 82°, 2 P.M., min. 67°, 1 A.M., mean hourly 72.7°.
Sun Thermometer, max. 104°, 1 P. M., bright sunshine 1 hr.
Mean dew point 66.0°, mean force vapor .8409, mean humidity 78.6°.
Wind, SW., total movement 171 m., mean hourly vel. 7.1 m., max. pressure 7 3-4 lbs.=39 m. per hour. 3 P. M. Began to rain 6-30 P. M. Ozone 5.

30. Barometer reduced to 32° F., max. 29.787, min. 29.659, mean 29.710.
Temperature, max. 75°, 9 A.M., min. 69°, 2 P. M., mean hourly 77.9°.
Sun Thermometer, max. 65°, 4 P. M., bright sunshine 0.
Mean dew point 70.0°, mean force vapor .7327, mean humidity 76.0°
Wind, SW., total movement 190 m., mean hourly vel. 7.9 m., max. pressure 7 lbs.=37 m. per hour, 10 A. M. Rain ended 3 A. M., .62 in. water fell; at base of tower 1.16 in. Showers began again at 9-30. Ozone 4.

31. Barometer reduced to 32° F., max. 29.851, min. 29.781, mean 29.830.
Temperature, max. 74°, 12 M., min. 67°, 11 P. M., mean hourly 69.6°
Sun Thermometer, max. 76°, 10 A. M., bright sunshine 0.
Mean due point 68.3°, mean force vapor .6928, mean humidity 95.0°
Wind, SW., total movement 107 m., mean hourly velocity 4.5 m., max. pressure 3-4 lb.=12 m. per hour, 3 P. M. Stopped raining at 6 A. M., 1.23 in. water fell; at base of tower, 1.69 in. Began to rain again at 7-30 A. M., still raining at 7 A. M., Aug. 1, 45 in. water; at base of tower, 58 in. Ozone 5.

C. D. WARNER, Meteorologist.

BULLETIN No. 8. AUGUST, 1889.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.150; actual minimum reading 29.510; Mean reduced to 32° F., 29.718; Monthly Range, .540.

Air Temperature. In Degrees Fahrenheit. Highest, 82.0°; Lowest, 45.0°; Mean, 65.5°; Monthly Range, 37.0°; Highest Mean Daily, 74.3°; Lowest Mean Daily, 59.5°; Mean Maximum, 75.0°; Mean Minimum, 56.9°; Mean Daily Range, 18.18; Greatest Daily Range, 31.0°.

Humidity. Mean Dew Point, 59.5°; Mean Force of Vapor, .6591; Mean Relative Humidity, 80.4.

Wind. Prevailing Directions, N., N. E., S. W.; Total Movement, 2811 miles; Greatest Daily Movement, 213 miles, 2nd; Least Daily Movement, 16 miles, 30th; Mean Daily Movement, 91 miles, Mean Hourly Velocity, 3.8 miles; Maximum Pressure per Square Foot 6 1-2 lbs.=36 m. per hour, 14th, at 3 P. M.

Precipitation. In inches. Total Precipitation, 2.35 in.; at base of tower 2.72 in.

Weather. Mean Cloudiness, on a Scale of 10, 4.3; Number of Clear Days, 7.; Number of Cloudy Days, 12; Number of Fair Days, 12; ,Total Cloudiness recorded by the Sun Thermometer, 221 hrs, or 53.4 per cent. Number of days on which .01 inches or more rain fell, 9. Wind followed by rain, 9th.

Bright Sunshine. Number of Hours Recorded, 194.

Halos, Lunar, 4th.

DAILY SUMMARY.

AUG. 1. Barometer reduced to 32° F., max. 29.857, min. 29.693, mean 29.748.
Temperature, max. 76°, 2 P. M., min. 66°, 2 A. M., mean hourly 70.7°.
Sun Thermometer, max. 72°, 12 M., bright sunshine 0.
Mean dew point 69.3°, mean force vapor .7091, mean humidity 93.6.
Wind, S. S. W., total movement, 138 m., mean hourly velocity 5.7 m., max. pressure, 5 lbs.=32 m. per hour, 3 P. M. Stopped raining at 9-30 A. M., .12 in. fell; at base of tower .21 in. Ozone 6.

2. Barometer reduced to 32° F., max. 29.701, min. 29.584, mean 29.640.
Temperature, max. 81°, 3 P. M., min. 69°, 2 A. M., mean hourly 74.3°.
Sun Thermometer, max. 101°, 12 M., bright sunshine 2 hrs.
Mean dew point 72.0°, mean force vapor .8752, mean humidity 89.6.
Wind, S. W., total movement 213 m., mean hourly vel. 8.7 m., max. pressure 3 1-2 lbs.=26 m. per hour, 2 P. M. Ozone 5.

3. Barometer reduced to 32° F., max. 29.656, min. 29.550, mean 29.624.
Temperature, max. 79°, 2 P. M., min. 65°, 12 P. M., mean hourly 72.1°.
Sun Thermometer, max. 102°, 12 M., bright sunshine 1 hr.
Mean dew point 71.3°, mean force vapor .8023, mean humidity 95.6.
Wind, S., total movement 201 m., mean hourly vel. 8.2 m., max. pressure 5 1-2 lbs.=33 m. per hour, 3 P. M. Thunder showers in the afternoon, .16 in. water fell; at base of tower .21 in. Ozone 3.

4. Barometer reduced to 32° F., max. 29.767, min. 29.653, mean 29.717.
Temperature, max. 78°, 3 P. M., min. 61°, 5 A. M., mean hourly 69.5°.
Sun Thermometer, max. 114°, 9 A. M., bright sunshine 7 hrs.
Mean dew point 59.3°, mean force vapor .7294, mean humidity 72.0.
Wind, S. W., total movement 88 m., mean hourly vel. 3.6 m., max. pressure 3 1-2 lbs.=26 m. per hour, 2 P. M. Ozone 6.

5. Barometer reduced to 32° F., max. 29.813, min. 29.709, mean 29.755.
Temperature, max. 70°, 6 P. M., min. 61°, 12 P. M., mean hourly 64.3°.
Sun Thermometer, max. 57°, 3 P. M., bright sunshine, 0.
Mean dew point 61.3°, mean force vapor .5683, mean humidity 96.3.
Wind, N. E., total movement 86 m., mean hourly vel. 3.6 m., max. pressure 1 1-2 lbs.=17 m. per hour, 1 P. M. Began to rain at 7 A. M., ended about 3 P. M., .12 in. water fell: at base of tower .15 in. Ozone 8.

6. Barometer reduced to 32° F., max. 29.885, min. 29.737, mean 29.820.
Temperature, max. 78°, 5 P. M., min. 56°, 5 A. M., mean hourly 65.6°.
Sun Thermometer, max. 115°, 2 P. M., bright sunshine 14 hrs..
Mean dew point 56.6°, mean force vapor .6432, mean humidity 73.3.
Wind, S. S. W., total movement 49 m., mean hourly vel. 2.0 m., max. pressure 0, Ozone 5.

7. Barometer reduced to 32° F., max. 29.851, min. 29.695., mean 29.771
Temperature, max. 75°, 4 P. M., min. 53°, 5 A. M., mean hourly 64.1°.
Sun Thermometer, max. 116°, 2 P. M., bright sunshine, 6 hrs.
Mean dew point 55.0°, mean force vapor .6191, mean humidity 73.0.
Wind, N. N. E., total movement 76 m., mean hourly vel. 3.2 m., max. pressure 1 1-2 lbs.=17 m. per hour, 2 P. M. Ozone 3.

8. Barometer reduced to 32° F., max. 29.878, min. 29.778, mean 29.831.
Temperature, max. 75°, 5 P. M., min. 53°. 5 A. M., mean hourly 64.4°.
Sun Thermometer, max. 112°, 2 P. M., bright sunshine 14 hrs.
Mean dew point 53.6°, mean force vapor .6314, mean humidity 67.
Wind, N. E., total movement 101 m., mean hourly vel. 4.2 m., max. pressure 4 lbs.=28 m. per hour, 9 A. M. Ozone 5.

9. Barometer reduced to 32° F., max. 29.820, min. 29.611, mean 29.670.
Temperature, max. 76°, 2 P. M, min. 61°, 4 A. M., mean hourly 67.3°.
Sun Thermometer, max. 114°, 12 M., bright sunshine 1 hr.
Mean dew point 61.6°, mean force vapor .7103, mean humidity 79.6.
Wind, S. S. W., total movement 202 m., mean hourly vel. 8.2 m., max. pressure 3 1-2 lbs.=26 m. per hour, 3 P. M. It rained from 6 to 9 P. M., .20 in. water fell; at base of tower .23 in. Ozone 4.

10. Barometer reduced to 32° F., max. 29.604, min. 29.440, mean 29.529.
Temperature, max. 78°, 5 P. M., min. 62°, 5 A. M., mean hourly 62.4°.
Sun Thermometer, max. 120°, 1 P. M., bright sunshine 5 hrs.
Mean dew point 62.6°, mean force vapor .7341, mean humidity 78.3.
Wind, W., total movement 144 m., mean hourly vel. 6 m., max. pressure 3 1-2 lb.,=26 m. per hour, 3 P. M. Ozone 6.

11. Barometer reduced to 32° F., max. 29.724, min. 29.566, mean. 29.622.
Temperature, max. 70°, 5 P. M., min. 57°, 12 P. M., mean hourly 64.0°.
Sun Thermometer, max. 124°, 1 P. M., bright sunshine 10 hrs.
Mean dew point 53.3°, mean force vapor .6075, mean humidity 69.
Wind, N., total movement 118 m., mean hourly vel. 4.9 m., max. pressure 4 lbs.=28 m. per hour, 10 A. M. Ozone 3.

12. Barometer reduced to 32° F.,, max. 29.774, min. 29.709, mean, 29.751.
Temperature, max. 70°, 3 P. M., min. 51°, 5 A. M., mean hourly 61.9°.
Sun Thermometer, max. 127°, 10 A. M., bright sunshine 9 hrs.
Mean dew point 53.0°, mean force vapor .5822, mean humidity 70.6.
Wind, W. N. W., total movement 62 m., mean hourly vel. 2.6 m., max. pressure 3 lbs.=24 m. per hour, 4 P. M. Light shower at 7-30 P. M., .01 in. water fell in both places. Ozone 3

13. Barometer reduced to 32° F., max. 29.800, min. 29.763, mean 29.787.
Temperature, max. 65°, 4 P. M., min. 59°, 6 A. M., mean hourly 62°.
Sun Thermometer, max. 50°, 8 A. M., bright sunshine 0.
Mean dew point 57.3°, mean force vapor .5489, mean humidity, 85.6.
Wind, S., total movement 70 m., mean hourly vel. 2.9 m., max. pressure 1-4 lb.,=7 m. per hour, 10 A. M. Light showers during the day. Ozone 4.

14. Barometer reduced to 32° F., max. 29.763, min. 29.442, mean 29.547.
Temperature, max. 63°, 4 P. M., min. 60°, 5 A. M., mean hourly 60.8°.
Sun Thermometer, max. 54°, 4 P. M., bright sunshine 0.
Mean dew point 59.6°, mean force vapor .5359, mean humidity, 96.3.
Wind, N.E., total movement 131 m., mean hourly vel. 5.5 m., max. pressure 6 1-2 lbs.=36 m, per hour, 3 P. M. Began to rain at 0-30 A. M., accompanied with thunder and lightning and ceased about noon, 1.30 in. water fell; at base of tower 1.37 in. Ozone 6.

15. Barometer reduced to 32° F., max. 29.557, min. 29.427, mean 29.468.
Temperature, max. 69°, 4 P. M., min. 56°, 12 P. M. mean hourly 61.8°.
Sun Thermometer, max. 86°, 3 P. M., bright sunshine 3 hrs.
Mean dew point 59.3°, mean force vapor .5588, mean humidity, 91.
Wind, N., total movement 55 m., mean hourly vel. 2.3 m., max. pressure 3-4 lb.=12 m. per hour, 6 P. M. Showers during the night and forenoon, .43 in. water fell; at base of tower .53 in. Ozone 6.

16. Barometer reduced to 32° F., max. 29.627, min. 29.515, mean 29.568.
Temperature, max. 72°, 4 P. M., min. 51°, 5 A. M. mean hourly 61.3°.
Sun Thermometer, max. 128°, 9 A. M., bright sunshine 10 hrs.
Mean dew point 53.3°, mean force vapor .5711, mean humidity 73.6.
Wind N.W., total movement 78 m., mean hourly vel. 3.2 m., max. pressure 1 1-4 lbs.=18 m. per hour, 2 P. M., Ozone 3.

17. Barometer reduced to 32° F., max. 29.715, min. 29.627, mean 29.661.
Temperature, max. 73°, 5 P. M., min. 50°, 5 A. M. mean hourly 62.4°.
Sun Thermometer, max. 130°, 9 A. M., bright sunshine 9 hrs.
Mean dew point 57°., mean force vapor .5949, mean humidity 79.6.
Wind, N.W., total movement 77 m., mean hourly vel. 3.2 m., max. pressure 1 1-2 lbs.=17 m. per hour, 5 P. M. Ozone 1.

18. Barometer reduced to 32° F., max. 29.777, min. 29.685, mean 29.734.
Temperature, max. 75°, 4 P. M. min. 52°, 6 A. M. mean hourly 63.3°.
Sun Thermometer, max. 122°, 1 P. M., bright sunshine 8 hrs.
Mean dew point 55.3°, mean force vapor .5976, mean humidity 77.6.
Wind, N., total movement 29 m., mean hourly vel. 1.2 m., max. pressure 1-4 lb.=7 m. per hour, 4 P. M., Ozone 5.

19. Barometer reduced to 32° F., max. 29.782, min. 29.634, mean 29.691.
Temperature, max. 76°, 2 P. M., min. 54°, 6 A. M., mean hourly 65.1°.
Sun Thermometer, max. 117°, 12 M., bright sunshine 3 hrs.
Mean dew point 60.3°, mean force vapor .6576, mean humidity 83.6.
Wind, N.W., total movement 53 m., mean hourly vel 2.2 m., max. pressure 1 lb.=14 m. per hour, 1 P. M. Showers about 5 P. M., .01 in. water fell in both places. Ozone 5.

20. Barometer reduced to 32° F., max. 29.634, min. 29.534, mean 29.595.
Temperature, max. 80°, 5 P. M. min. 60°, 6 A. M. mean hourly 69.8°.
Sun Thermometer, max. 133°, 12 M., bright sunshine 7 hrs.
Mean dew point 62.6°, mean force vapor .7440, mean humidity, 79.6.
Wind, N., total movement 72 m., mean hourly vel. 3 m., max. pressure 4 lbs.=28 m. per hour, 1 P. M. Ozone 6.

21. Barometer reduced to 32° F., max. 29.615, min. 29.481, mean 29.546.
Temperature, max. 78°., 5 P. M. min. 59°, 5 A. M., mean hourly 69°.
Sun Thermometer, max. 113°, 1 P. M., bright sunshine 3 hrs.
Mean dew point 65.6°, mean force vapor .7383, mean humidity, 87.3.
Wind, S.W., total movement 80 m., mean hourly vel. 3.3 m., max. pressure 1 lb.=14 m. per hour, 8 P. M. Ozone 1.

22. Barometer reduced to 32° F., max. 29.642, min. 29.461, mean 29.531.
Temperature, max. 77°, 4 P. M., min. 62°, 12 P. M., mean hourly 71.1°.
Sun Thermometer, max. 124°, 9 A. M., bright sunshine 10 hrs.
Mean dew point 59.3°, mean force vapor .7627, mean humidity, 67.6.
Wind, N., total movement 141 m., mean hourly vel. 5.9 m., max. pressure 4 1-4 lbs.=29 m. per hour, 1 P. M. Ozone 6.

23. Barometer reduced to 32° F., max. 29.723, min. 29.640, mean 29.681.
Temperature, max. 77, 2 P. M., min, 57°, 5 A. M., mean hourly, 66.9°.
Sun Thermometer, max. 123°, 1 P. M., bright sunshine 1 hr.
Mean dew point 59.0°, mean force vapor .7011, mean humidity, 74.3.
Wind, N., total movement 22 m., mean hourly vel. 0.9 m., max. pressure 0. Ozone 2.

24. Barometer reduced to 32° F., max. 29.825, min. 29.624, mean 29.768.
Temperature, max. 80°, 5 P. M., min. 62°, 5 A. M., mean hourly 68.7°.
Sun Thermometer, max. 133°, 1 P. M., bright sunshine 8 hrs.
Mean dew point 63°, mean force vapor .7193, mean humidity, 83.6.
Wind, S.W., total movement 40 m., mean hourly vel. 1.7 m., max. pressure 1-2 lb.=10 m. per hour, 8 P. M. Ozone 1.

25. Barometer reduced to 32° F., max. 29.897, min. 29.782, mean 29.848.
Temperature, max. 80°, 4 P. M., min. 60°, 5 A. M., mean hourly 67.4°.
Sun Thermometer, max. 132°, 1 P. M., bright sunshine 8 hrs.
Mean dew point 62.6°, mean force vapor .6973, mean humidity 84.6.
Wind, N.E., total movement 57 m., mean hourly vel. 2.4 m., max. pressure 1 1-2 lbs.=17 m. per hour, 6 P. M., Ozone 6.

26. Barometer reduced to 32° F., max. 30.079, min. 29.895, mean 29.993.
Temperature, max. 70°, 1 P. M., min. 55°, 12 P. M., mean hourly 63.5°.
Sun Thermometer, max. 124°, 11 A. M., bright sunshine 6 hrs.
Mean dew point 55.6°, mean force vapor .5889, mean humidity 76.3.
Wind, E., total movement 162 m., mean hourly vel. 6.7 m., max. pressure 1 3-4 lbs.=19 m, per hour, 11 A. M. Ozone 6.

27. Barometer reduced to 32° F., max. 30.079, min. 29.923, mean 30.000.
Temperature, max. 72°. 5 P.M., min. 49°, 6 A.M., mean hourly 60.2°.
Sun Thermometer, max. 135°, 12 M., bright sunshine 9.
Mean dew point 54.3°, mean force vapor .5517, mean humidity 79.6.
Wind, N.E., total movement 85 m., mean hourly vel. 3.5 m., max. pressure 1-2 lb.=10 m. per hour 7 P. M. Ozone 4.

28. Barometer reduced to 32° F., max. 30.008, min. 29.858, mean 29.931
Temperature, max. 74°, 5 P. M., min. 47°, 5 A.M., mean hourly 59.5°.
Sun Thermometer, max. 136°, 12 M., bright sunshine 10 hrs.
Mean dew point 52.3°, mean force vapor .5600, mean humidity 76.
Wind, E., total movement 63 m., mean hourly vel. 2.6 m., max. pressure 1-2 lb.=10 m. per hour, 7 P. M. Ozone 4.

29. Barometer reduced to 32° F., max. 29.928, min. 29.758, mean 29.846.
Temperature, max. 76°, 4 P,M., min. 45°, 5 A.M., mean hourly 59.7°.
Sun Thermometer, max. 130°, 1 P. M., bright sunshine 10 hrs.
Mean dew point 56°, mean force vapor .5641, mean humidity 84.
Wind, S.W., total movement 27 m., mean hourly vel. 1.1 m., max. pressure 0. Ozone 5.

30. Barometer reduced to 32° F., max. 29.826, min. 29.687, mean 29.757.
Temperature, max. 82°, 3 P.M., min. 53°, 5 A. M., mean hourly 67.7°.
Sun Thermometer, max. 137°, 12 M., bright sunshine 13 hrs.
Mean dew point 62.6°, mean force vapor .7537, mean humidity 79.0.
Wind, S.W., total movement 16 m., mean hourly vel. 0.6 m., max. pressure 0. Ozone 3.

31. Barometer reduced to 32° F., max. 29.997, min. 29.759, mean 29.820.
Temperature, max. 81°, 4 P. M., min. 59°, 5 A. M., mean hourly 70.4°
Sun Thermometer, max. 138°, 1 P. M., bright sunshine 7 hrs.
Mean dew point 61.6°, mean force vapor .7741, mean humidity 74.3.
Wind, N.E., total movement 75 m., mean hourly velocity 3.1 m., max. pressure 3-4 lb.=12 m. per hour, 1 P. M. Ozone 1.

C. D. WARNER, Meteorologist.

BULLETIN No. 9. SEPTEMBER, 1889.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.100; actual minimum reading 29.120; Mean reduced to 32° F., 29.709; Monthly Range, .980.

Air Temperature. In Degrees Fahrenheit. Highest, 79.0°; Lowest, 40.0°; Mean, 61.9°; Monthly Range, 39.0°; Highest Mean Daily, 72.2°; Lowest Mean Daily, 50.7°; Mean Maximum, 68.9°; Mean Minimum, 55.4°; Mean Daily Range, 13.4°; Greatest Daily Range, 28.0°.

Humidity. Mean Dew Point, 56.9°; Mean Force of Vapor, .5824; Mean Relative Humidity, 83.3.

Wind. Prevailing Direction, S. W.; Total Movement, 4310 miles; Greatest Daily Movement, 328 miles, 11th; Least Daily Movement, 34 miles, 2nd; Mean Daily Movement, 143.6 miles, Mean Hourly Velocity, 6.0 miles; Maximum Pressure per Square Foot 9 3-4 lbs.=44 m. per hour, 10th, at 9 A. M.

Precipitation. In inches. Total Precipitation, 2.36 in.; at base of tower 3.17 in.

Weather. Mean Cloudiness, on a Scale of 10, 6.5; Number of Clear Days, 8; Number of Cloudy Days, 19; Number of Fair Days, 3; Total Cloudiness recorded by the Sun Thermometer, 239 hrs, or 66.6 per cent. Number of days on which .01 inches or more rain fell, 11. Winds followed by rain, 11th, 17th, 20th, and 30th.

Bright Sunshine. Number of Hours Recorded, 120.

Thunder Storm, 17th.

Frost, 21st and 23rd.

DAILY SUMMARY.

SEPT. 1. Barometer reduced to 32° F., max. 30.013, min. 29.907, mean 29.979. Temperature, max. 77°, 3 P. M., min. 60°, 6 A. M., mean hourly 68.3°. Sun Thermometer, max. 129°, 2 P.M., bright sunshine 11 hrs. Mean dew point 59.6°, mean force vapor .7129, mean humidity 74. Wind, N. N. E., total movement, 62 m., mean hourly velocity 2.6 m., max. pressure, 1-4lbs.=7 m. per hour, 10 A. M. Ozone 6.

2. Barometer reduced to 32° F., max. 30.014, min. 29.835, mean 29.912. Temperature, max. 76°, 3 P. M., min. 53°, 7 A. M., mean hourly 65.7°. Sun Thermometer, max. 120°, 12 M., bright sunshine 12 hrs. Mean dew point 60.6°, mean force vapor .6752, mean humidity 81.6. Wind, S. W., total movement 34 m., mean hourly vel. 1.4 m., max. pressure 1-4 lbs.=7 m. per hour, 9 P. M. Ozone 6.

3. Barometer reduced to 32° F., max. 29.870, min. 29.743, mean 29.808. Temperature, max. 76°, 3 P. M., min. 62°, 7 A. M., mean hourly 68.5°. Sun Thermometer, max. 119°, 1 P. M., bright sunshine 12 hrs. Mean dew point 65.0°, mean force vapor .7178, mean humidity 87. Wind, S., total movement 58 m., mean hourly vel. 2.4 m., max. pressure 1-4 lbs.=7 m. per hour, 10 P. M. Ozone 3.

4. Barometer reduced to 32° F., max. 29.855. min. 29.743, mean 29.801.
Temperature, max. 76°. 3 P. M., min. 58°, 5 A. M., mean hourly 67.5°.
Sun Thermometer. max. 132°, 1 P. M., bright sunshine 12 hrs.
Mean dew point 63.0°, mean force vapor .7193, mean humidity 83.6.
Wind, S. W., total movement 77 m., mean hourly vel. 3.2 m., max. pressure 1 lb.=14 m. per hour, 8 P. M. Ozone 4.

5. Barometer reduced to 32° F., max. 29.827. min. 29.720, mean 29.780.
Temperature, max. 77°. 5 P. M., min. 63°, 4 A. M., mean hourly 68.9°.
Sun Thermometer, max. 124°. 1 P. M., bright sunshine, 9 hrs.
Mean dew point 62.6°, mean force vapor .7259, mean humidity 80.6.
Wind, S. W., total movement 129 m., mean hourly vel.5.4 m., max. pressure 2 1-2 lbs.=22 m. per hour, 10 A. M. Ozone 3.

6. Barometer reduced to 32° F., max. 29.772. min. 29.652. mean 29.717.
Temperature, max. 81°, 1 P. M., min. 64°, 6 A. M., mean hourly 72.2°.
Sun Thermometer, max. 121°. 1 P. M., bright sunshine 5 hrs.
Mean dew point 67.6°. mean force vapor .8219, mean humidity 84.
Wind. S. W., total movement 156 m., mean hourly vel. 6.5 m., max. pressure 4 1-4 lbs.=29 m. per hour, 2 P. M. Ozone 5.

7. Barometer reduced to 32° F., max. 29.862. min. 29.777., mean 29.827
Temperature, max. 70°, 2 P. M., min. 63°. 6 A. M., mean hourly 66.0°.
Sun Thermometer. max. 119°, 1 P. M., bright sunshine, 3 hrs.
Mean dew point 62.6°, mean force vapor .6340. mean humidity 90.3.
Wind. N. N. E., total movement 172 m., mean hourly vel. 7.2 m., max. pressure 5 1-2 lbs.=33 m. per hour. 5 A. M. Ozone 5.

8. Barometer reduced to 32° F., max. 29.855. min. 29.788, mean 29.820.
Temperature, max. 74°, 12 M., min. 63°. 5 A. M., mean hourly 68.1°.
Sun Thermometer, max. 105°, 11 A. M., bright sunshine 1 hr.
Mean dew point 64 0°, mean force vapor .6979. mean humidity 86.
Wind. N., total movement 75 m., mean hourly vel. 3.1 m., max. pressure 1-4 lbs.=7 m. per hour, 1 P. M. Ozone 6.

9. Barometer reduced to 32° F., max. 29.890. min. 29.831. mean 29.859.
Temperature, max. 73°. 2 P. M, min. 60°. 5 A. M., mean hourly 67.0°.
Sun Thermometer, max. 97°. 1 P. M., bright sunshine 1 hr.
Mean dew point 62.3°, mean force vapor .6752, mean humidity 84.
Wind. N. N. E., total movement 182 m., mean hourly vel. 7.6 m., max. pressure 4 lbs.=28 m. per hour. 11 P. M. Ozone 5.

10. Barometer reduced to 32° F., max. 29.847. min.29.791. mean 29.821.
Temperature, max. 70°. 11 A. M.,min. 63°. 3 A.M., mean hourly 65.4°
Sun Thermometer, max. 79°. 12 M., bright sunshine 0.
Mean dew point 59.0°. mean force vapor .6249. mean humidity 80.3.
Wind. N. E., total movement 311 m., mean hourly vel. 12.9 m., max pressure 9 3-4 lb.,=44 m. per hour. 9 A. M. Inappreciable showers in the afternoon. Ozone 3.

11. Barometer reduced to 32° F., max. 29.817. min. 29.752. mean. 29.765.
Temperature, max. 67°. 2 P. M.,min. 62°. 5 A. M., mean hourly 64.2°.
Sun Thermometer, max. 51°, 1 P. M., bright sunshine 0.
Mean dew point 62.0°, mean force vapor .6138, mean humidity 89.6
Wind, N.E., total movement 328 m., mean hourly vel. 13.7 m., max. pressure 8 1-4 lbs.=41 m. per hour, 12 M. Showers all day, .12 in. water fell; at base of tower .23 in. Ozone 1.

12. Barometer reduced to 32° F.,, max. 29.883. min. 29.737, mean, 29.818.
Temperature, max.65°, 11 A.M., min. 61°. 11 P.M., mean hourly 62.9°.
Sun Thermometer, max. 43°. 10 A. M., bright sunshine 0.
Mean dew point 60.0°, mean force vapor .5681, mean humidity 91.0.
Wind, N. N. E., total movement 280 m., mean hourly vel. 11.7 m., max. pressure 6 3-4 lbs.=37 m. per hour, 9 A. M. Showers ceased about 3 P. M., .02 in. water fell; at base of tower .05 in. Ozone 1.

13. Barometer reduced to 32° F., max. 29.925, min. 29.879, mean 29.896.
Temperature. max. 68°. 1 P. M., min. 61°, 1 A. M., mean hourly 64°.
Sun Thermometer, max. 111°. 12 M., bright sunshine 0.
Mean dew point 62.0°. mean force vapor .6110, mean humidity, 91.3.
Wind, N. E., total movement 246 m., mean hourly vel. 10.2 m., max. pressure 5 lbs.,=32 m. per hour, 12 M. Showers at 4 and 7 P. M. .03 in. water fell; at base of tower, .05 in. Ozone 1.

14. Barometer reduced to 32° F., max. 29.945, min. 29.877, mean 29.907.
Temperature, max. 72°, 4 P. M., min. 62°, 6 A. M., mean hourly 66.7°.
Sun Thermometer, max. 72°. 4 P. M., bright sunshine 0.
Mean dew point 65.6°. mean force vapor .6653, mean humidity, 95.
Wind, N.E., total movement 98 m., mean hourly vel. 4.1 m., max. pressure 1-4 lb.=17 m. per hour, 2 P. M. Ozone 4.

15. Barometer reduced to 32° F., max. 29.877, min. 29.717, mean 29.783.
Temperature, max. 78°, 4 P. M., min. 65°, 7 A. M. mean hourly 70.5°.
Sun Thermometer, max. 126°. 1 P. M., bright sunshine 1 hr.
Mean dew point 68.3°, mean force vapor .7665, mean humidity, 91.6.
Wind, S. W., total movement 91 m., mean hourly vel. 3.8 m., max. pressure 2 3-4 lbs.=23 m. per hour, 5 P.M. Inappreciable showers at 8-30 A. M. and 5 P. M. Ozone 4.

16. Barometer reduced to 32° F., max. 29.731, min. 29.618, mean 29.666.
Temperature, max. 79°. 2 P. M., min. 69°, 6 A.M.. mean hourly 72.4°.
Sun Thermometer. max. 110°, 3 P. M.. bright sunshine 2 hrs.
Mean dew point 71.3°, mean force vapor .8266, mean humidity 93.
Wind S.W., total movement 202 m., mean hourly vel. 8.3 m., max. pressure 4 lbs.=28 m. per hour. 2 P. M., Ozone 5.

17. Barometer reduced to 32° F., max. 29.666. min. 29.503, mean 29.613.
Temperature, max. 73°, 3 P. M., min. 69°, 5 A. M. mean hourly 70.6°.
Sun Thermometer, max. 50°. 2 P. M., bright sunshine 0.
Mean dew point 71°., mean force vapor .7665. mean humidity 97.
Wind. S.W., total movement 236 m., mean hourly vel. 9.8 m., max. pressure 8 lbs.=40 m. per hour, 4 P. M. Showers began at 8 A.M., 1.63 in. water fell; at base of tower 2.12 in. Ozone 3.

18. Barometer reduced to 32° F., max. 29.508, min. 29.453, mean 29.492.
Temperature, max. 68°, 1 P.M., min. 54°. 12 P.M. mean hourly 63.2°.
Sun Thermometer. max. 51°, 9 A. M., bright sunshine 0.
Mean dew point 61.6°, mean force vapor .5946, mean humidity 93.6.
Wind. N., total movement 61 m., mean hourly vel. 2.5 m., max. pressure 1 lb.=14 m. per hour, 2 A. M.. Rained more or less all day, .18 in. water fell; at base of tower .23 in. Ozone 0.

19. Barometer reduced to 32° F., max. 29.453, min. 29.205, mean 29.257.
Temperature, max. 57°, 3 P. M.. min. 50°. 9 A. M.. mean hourly 51.9°.
Sun Thermometer, max. 59°. 3 P.M.. bright sunshine 0.
Mean dew point 49.0°. mean force vapor .3738, mean humidity 89.
Wind, N.N.W., total movement 116 m., mean hourly vel 4.8 m., max. pressure 6 1-2 lbs.=36 m. per hour, 4 P.M. Rain ceased at 9 A.M., .05 in. fell; at base of tower .06 in. Ozone 1.

20. Barometer reduced to 32° F., max. 29.294. min. 29.119, mean 29.199.
Temperature, max. 61°, 3 P.M., min. 46°, 4 A. M. mean hourly 53.4°.
Sun Thermometer, max. 97°, 12 M., bright sunshine 1 hr.
Mean dew point 49°, mean force vapor .4068. mean humidity, 83.6.
Wind, S.W., total movement 190 m., mean hourly vel. 7.9 m., max. pressure 8 lbs.=40 m. per hour, 5 P. M. Began to rain at 6 P.M., and stopped in the night, .07 in. water fell; at base of tower .11 in. Ozone 5.

21. Barometer reduced to 32° F., max. 29.338, min. 29.059, mean 29.143.
Temperature, max. 61°., 2 P.M., min. 48°, 12 P.M., mean hourly 54.4°.
Sun Thermometer, max. 111°, 12 M., bright sunshine 2 hrs.
Mean dew point 46.6°, mean force vapor .4276, mean humidity, 77.0.
Wind, N.W., total movement 210 m., mean hourly vel. 8.8 m., max. pressure 5 lbs.=32 m. per hour, 12 M. Shower at 11 A. M., .01 in. water fell in both places. Ozone 4.

22. Barometer reduced to 32° F., max. 29.664, min. 29.338, mean 29.551.
Temperature, max. 55°, 4 P. M., min. 46°, 12 P. M., mean hourly 49.8°.
Sun Thermometer, max. 99°, 12 M., bright sunshine 7 hrs.
Mean dew point 39.6°, mean force vapor .3575, mean humidity, 68.
Wind, N.W., total movement 196 m., mean hourly vel. 8.2 m., max. pressure 6 1-2 lbs.=36 m. per hour, 9 A. M. Ozone 3.

23. Barometer reduced to 32° F., max. 29.790, min. 29.664, mean 29.738.
Temperature, max. 63°, 4 P.M., min, 40°, 6 A. M., mean hourly, 51.6°.
Sun Thermometer, max. 106°, 11 A. M., bright sunshine 11 hrs.
Mean dew point 40°, mean force vapor .3979, mean humidity, 67.6.
Wind, N.W., total movement 108 m., mean hourly vel. 4.5 m., max. pressure 4 lbs.=28 m. per hour, 12 M. Ozone 0.

24. Barometer reduced to 32° F., max. 29.840, min. 29.731, mean 29.782.
Temperature, max. 69°, 5 P. M., min. 41°, 6 A. M., mean hourly 55.7°.
Sun Thermometer, max. 120°, 1 P. M., bright sunshine 9 hrs.
Mean dew point 47°. mean force vapor .4829, mean humidity, 72.3.
Wind, S., total movement 49 m., mean hourly vel. 2.0 m., max. pressure 1-4 lb.=7 m. per hour, 4 P. M. Ozone 0.

25. Barometer reduced to 32° F., max. 29.815, min. 29.718, mean 29.764.
Temperature, max. 67°, 2 P. M., min. 49°, 6 A. M., mean hourly 58.3°.
Sun Thermometer, max. 68°. 1 P. M., bright sunshine 2 hrs.
Mean dew point 54.0°, mean force vapor .5187. mean humidity 84.
Wind, S. E., total movement 49 m., mean hourly vel. 2.0 m., max. pressure 1 1-4 lbs.=16 m. per hour. 4 P. M., Ozone 1.

26. Barometer reduced to 32° F., max. 29.718, min. 29.441, mean 29.551.
Temperature. max. 66°, 3 P. M., min. 52°, 12 P. M., mean hourly 58.0°.
Sun Thermometer, max. 99°, 2 P. M., bright sunshine 0.
Mean dew point 56.0°. mean force vapor .3936, mean humidity 91.6.
Wind, N., total movement 82 m., mean hourly vel. 3.4 m., max. pressure 3 1-4 lbs.=25 m, per hour, 10 P.M. Rain began at 2 A.M. and ended at 9 P.M., .25 in. fell; at base of tower .31 in. Ozone 4.

27. Barometer reduced to 32° F., max. 29.750, min. 29.598, mean 29.669.
Temperature, max. 60°, 4 P.M., min. 44°, 6 A.M., mean hourly 50.7°.
Sun Thermometer, max. 102°, 11 A.M., bright sunshine 6 hrs.
Mean dew point 39.3°, mean force vapor .3680, mean humidity 67.3.
Wind, N. W., total movement 144 m., mean hourly vel. 6 m., max. pressure 8 3-4 lb.=42 m. per hour 5 P. M. Ozone 3.

28. Barometer reduced to 32° F., max. 29.812. min. 29.746, mean 29.781
Temperature, max. 57°, 3 P. M., min. 44°, 5 A.M., mean hourly 51.1°.
Sun Thermometer, max. 96°, 11 A.M., bright sunshine 3 hrs.
Mean dew point 42.3°. mean force vapor .3891, mean humidity 70.6.
Wind, N.W., total movement 143 m., mean hourly vel. 5.9 m., max. pressure 5 1-4 lbs.=32 m. per hour, 10 A. M. Ozone 5.

29. Barometer reduced to 32° F., max. 29.936, min. 29.805, mean 29.870.
Temperature, max. 62°, 4 P.M., min. 42°. 6 A.M., mean hourly 52.0°.
Sun Thermometer. max. 112°, 1 P. M., bright sunshine 9 hrs.
Mean dew point 43°, mean force vapor .3999, mean humidity 72.3.
Wind, N.N.W., total movement 64 m., mean hourly vel. 2.7 m., max. pressure 1 1-2 lbs.=17 m. per hour, 11 A.M. Ozone 6.

30. Barometer reduced to 32° F., max. 29.870. min. 29.532, mean 29.698.
Temperature, max. 68°, 2 P.M., min. 50°. 3 A. M., mean hourly 58.3°.
Sun Thermometer, max. 106°, 12 M., bright sunshine 1 hr.
Mean dew point 53.6°, mean force vapor .5201. mean humidity 82.3.
Wind. S.W., total movement 161 m., mean hourly vel. 6.7 m., max. pressure 7 1-4 m. per hour, 8 P. M. Light showers began at 3-30 P. M. Ozone 4.

C. D. WARNER, Meteorologist.

BULLETIN No. 10. OCTOBER, 1889.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.208; actual minimum reading 29.270; Mean reduced to 32° F., 29.750; Monthly Range, .938.

Air Temperature. In Degrees Fahrenheit. Highest, at top of tower, 69.0°; at base of tower, 69.5°; Lowest, at top of tower, 26.0°; at base of tower, 21.0°; Mean, 46.5°; Monthly Range, 43.0°; Highest Mean Daily, 61.3°; Lowest Mean Daily, 35.2°; Mean Maximum, 53.9°; Mean Minimum, 38.9°; Mean Daily Range, 15.4°; Greatest Daily Range, 29.0°.

Humidity. Mean Dew Point, 39.4°; Mean Force of Vapor, .3349; Mean Relative Humidity, 75.7.

Wind. Prevailing Direction, N. N. E.; Total Movement, 4762 miles; Greatest Daily Movement, 367 miles, 15th; Least Daily Movement, 20 miles, 31st; Mean Daily Movement, 153.6 miles, Mean Hourly Velocity, 6.4 miles; Maximum Pressure per Square Foot 12 1-4 lbs.=49 m. per hour, 14th, at 12 M. and 15th, 4 A. M.

Precipitation. In inches. Total Precipitation, 3.59 in.; at base of tower 4.58 in.

Weather. Mean Cloudiness, on a Scale of 10, 6.0; Number of Clear Days, 9; Number of Cloudy Days, 16; Number of Fair Days, 6; Total Cloudiness recorded by the Sun Thermometer, 193 hrs, or 59.9 per cent. Number of days on which .01 inches or more rain fell, 14. Winds followed by rain, 1st; by clear or fair weather, 2nd.

Bright Sunshine. Number of Hours Recorded, 129.

Thunder Storm, 1st. ***Snow,*** on northern hills, 13th.

Frost, 3rd, 5th, 8th, 9th, 11th, 12th, 16th, 17th, 19th, 22nd, 23rd and 24th.

Auroras, 21st. ***Meteors,*** 21st.

DAILY SUMMARY.

OCT. 1. Barometer reduced to 32° F., max. 29.532, min. 29.163, mean 29.242.
*Temperature, max. 69°, 69.5°, 4 P.M., min. 55°, 57°; 12 P.M., mean hourly 61.3°.
Sun Thermometer, max. 106°, 1 P.M., bright sunshine 3 hrs.
Mean dew point 59.0°, mean force vapor .5585, mean humidity 90.0.
Wind, S. S. W., total movement, 213 m., mean hourly velocity 8.9. m., max. pressure, 4 1-2 lbs.=30 m. per hour, 6 A. M. Showers ceased at 11-30 A. M., .18 in. water fell; at base of tower .31 in. Ozone 8.

2. Barometer reduced to 32° F., max. 29.754. min. 29.240, mean 29.530.
Temperature, max. 57°, 59.5°, 10 A.M., min.42°, 43°, 12 P.M., mean hourly 51.7°.
Sun Thermometer, max. 94°, 9 A.M., bright sunshine 1 hr.
Mean dew point 47.3°, mean force vapor .3775, mean humidity 76.3.
Wind, N.W., total movement 204 m., mean hourly vel. 8.3 m., max. pressure 10 lbs.=45 m. per hour, 11 A. M. Ozone 6.

3. Barometer reduced to 32° F., max. 29.847, min. 29.657, mean 29.733.
Temperature, max. 59°, 59.5°, 2 P. M., min. 36°, 31°, 6 A. M., mean hourly 48.6°.
Sun Thermometer, max. 109°, 10 A. M., bright sunshine 10 hrs.
Mean dew point 41.6°, mean force vapor .3734, mean humidity 75.0.
Wind, S.S.W., total movement 141 m., mean hourly vel. 5.9 m., max. pressure 3 3-4 lbs.=27 m. per hour, 3 P. M. Ozone 1.

*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to 32° F., max. 29.871, min. 29.683, mean 29.759.
Temperature, max. 62°, 64°, 12 M., min. 43°, 39.5°, 12 P. M., mean hourly 52.1°.
Sun Thermometer, max. 119°, 11 A. M., bright sunshine 4 hrs.
Mean dew point 44.6°, mean force vapor .4014, mean humidity 76.0.
Wind, N.N.E., total movement 143 m., mean hourly vel. 5.9 m., max. pressure 3 1-2 lbs.=26 m. per hour, 1 P. M. Ozone 7.

5. Barometer reduced to 32° F., max. 29.894, min. 29.719, mean 29.800.
Temperature, max. 56°, 56.5°, 3 P. M., min. 37°, 32°, 6 A. M., mean hourly 47.8°.
Sun Thermometer, max. 103°, 12 M., bright sunshine 10 hrs.
Mean dew point 38.6°, mean force vapor .3498, mean humidity 70.3.
Wind, S.S.E., total movement 96 m., mean hourly vel. 4.0 m., max. pressure 1 3-4 lbs.=19 m. per hour, 5 P. M. Ozone 1.

6. Barometer reduced to 32° F., max. 29.740, min. 29.536, mean 29.618.
Temperature, max. 56°, 57°, 2 P. M., min. 49°, 47°, 4 A. M., mean hourly 51.0°.
Sun Thermometer, max. 55°, 12 M., bright sunshine 0.
Mean dew point 50.6°, mean force vapor .3894, mean humidity 95.6.
Wind, N., total movement 160 m., mean hourly vel. 6.5 m., max. pressure 2 1-2 lbs.=22 m. per hour, 12 P. M. Showers began at 7-30 A. M. Ozone 6.

7. Barometer reduced to 32° F., max. 29.582, min. 29.423, mean 29.480.
Temperature, max. 50°, 51°, 12 M., min. 43°, 42.5°, 12 P. M., mean hourly 47.3°.
Sun Thermometer, max. 82°, 3 P. M., bright sunshine, 0.
Mean dew point 44.0°, mean force vapor .3223, mean humidity 89.0.
Wind, N. W., total movement 215 m., mean hourly vel. 8.9 m., max. pressure 5 1-2 lbs.=33 m. per hour, 10 A. M. Showers ceased 7-30 A. M., 1.19 in. water fell; at base of tower 1.42 in. Ozone 7.

8. Barometer reduced to 32° F., max. 29.693, min. 29.582, mean 29.669.
Temperature, max. 47°, 46°, 3 P.M., min. 39°, 34°, 5 A. M., mean hourly 42.2°.
Sun Thermometer, max. 98°, 7 A. M., bright sunshine 0.
Mean dew point 34.6°, mean force vapor .2645, mean humidity 77.0.
Wind, W., total movement 145 m., mean hourly vel. 6.0 m., max. pressure 3 3-4 lbs.=27 m. per hour, 12 M. Ozone 0.

9. Barometer reduced to 32° F., max. 29.695, min. 29.578, mean 29.611.
Temperature, max. 54°, 56.5°, 12 M., min. 37°, 32.5°, 6 A. M., mean hourly 46.8°.
Sun Thermometer, max. 138°, 11 A. M., bright sunshine 5 hrs.
Mean dew point 36.3°, mean force vapor .3255, mean humidity 67.3.
Wind, S., total movement 189 m., mean hourly vel. 7.7 m., max. pressure 5 lbs.=32 m. per hour, 12 M. Ozone 5.

10. Barometer reduced to 32° F., max. 29.638, min. 29.498, mean 29.545.
Temperature, max. 52°, 54°, 1 P. M., min. 39°, 39.5°, 12 P.M., mean hourly 46.2°.
Sun Thermometer, max. 131°, 12 M., bright sunshine 2 hrs.
Mean dew point 34.6°, mean force vapor .3207, mean humidity 63.3.
Wind, N.W., total movement 158 m., mean hourly vel. 6.6 m., max. pressure 4 3-4 lbs.,=31 m. per hour, 12 M. Rainy from 7 A. M. to 12 M., .08 in. water fell; at base of tower .15 in. Ozone 2.

11. Barometer reduced to 32° F., max. 29.700, min. 29.590, mean. 29.657.
Temperature, max. 55°, 55.5°, 2 P. M., min. 35°, 29.5°, 4 A. M., mean hourly 43.9°.
Sun Thermometer, max. 127°, 12 M., bright sunshine 2 hrs.
Mean dew point 37.3°, mean force vapor .3184, mean humidity 72.6.
Wind, S.S.E., total movement 60 m., mean hourly vel. 2.5 m., max. pressure 1-4 lb.=7 m. per hour, 12 M. Ozone 6.

12. Barometer reduced to 32° F.,, max. 29.755, min. 29.645, mean, 29.712.
Temperature, max. 57°, 60.5°, 2 P.M., min. 33°, 29.5°, 6 A.M., mean hourly 45.5°.
Sun Thermometer, max. 122°, 12 M., bright sunshine 8 hrs.
Mean dew point 41.0°, mean force vapor .3270, mean humidity 82.6.
Wind, N. N. E., total movement 61 m., mean hourly vel. 2.5 m., max. pressure 1 1-4 lbs.=16 m. per hour, 9 P. M. Began to rain 6 P. M. Ozone 6.

13. Barometer reduced to 32° F., max. 29.837, min. 29.806, mean 29.825.
Temperature, max. 46°, 47°, 3 P.M., min. 36°, 32°, 8 A.M., mean hourly 41.7°.
Sun Thermometer, max. 68°, 12 M., bright sunshine 0.
Mean dew point 35.3°, mean force vapor .2648, mean humidity 79.0.

Wind, N. E., total movement 249 m., mean hourly vel. 10.4 m., max. pressure 8 1-4 lbs.=41 m. per hour, 11 A. M. Ceased raining 7-30 A. M., .95 in. water fell; at base of tower 1.27 in. Ozone 9.

14. Barometer reduced to 32° F., max. 29.796, min. 29.614, mean 29.696.
Temperature, max. 48°, 47°, 3 P. M., min. 40°, 36.5°, 3 A. M., mean hourly 44.0°.
Sun Thermometer, max. 58°, 12 M., bright sunshine 0.
Mean dew point 36.3°, mean force vapor .3008, mean humidity 71.3.
Wind, N.N.E., total movement 309 m., mean hourly vel. 12.9 m., max. pressure 12 1-4 lbs.=49 m. per hour, 12 M. Ozone 8.

15. Barometer reduced to 32° F., max. 29.850, min. 29.600, mean 29.672.
Temperature, max. 59°, 60°, 3 P. M., min. 43°, 40.5°, 7 A.M., mean hourly 49.9°.
Sun Thermometer, max. 134°, 1 P. M., bright sunshine 9 hrs.
Mean dew point 38.0°, mean force vapor .3726, mean humidity 62.6.
Wind, N.N.E., total movement 367 m., mean hourly vel. 15.3 m., max. pressure 12 1-4 lbs.=49 m. per hour, 4 A.M. Ozone 1.

16. Barometer reduced to 32° F., max. 29.919, min. 29.806, mean 29.868.
Temperature, max. 57°, 58.5°, 4 P.M., min. 37°, 32.5°, 12 P.M., mean hourly 45.9°.
Sun Thermometer, max. 144°, 1 P. M., bright sunshine 11 hrs.
Mean dew point 31.6°, mean force vapor .3123, mean humidity 60.0.
Wind N.E., total movement 187 m., mean hourly vel. 7.8 m., max. pressure 7 lbs.=37 m. per hour, 11 A. M. Ozone 0.

17. Barometer reduced to 32° F., max. 29.893, min. 29.650, mean 29.775.
Temperature, max. 60°, 59.5°, 4 P. M., min. 31°, 27°, 6 A.M., mean hourly 46.3°.
Sun Thermometer, max. 140°, 12 M., bright sunshine 8 hrs.
Mean dew point 33.3°, mean force vapor .3426, mean humidity 60.3.
Wind, S.W., total movement 70 m., mean hourly vel. 2.9 m., max. pressure 1 1-4 lbs.=16 m. per hour, 4 P. M. Ozone 2.

18. Barometer reduced to 32° F., max. 29.820, min. 29.661, mean 29.743.
Temperature, max. 56°, 56°, 5 P.M., min. 43°, 37°, 12 P.M., mean hourly 49.0°.
Sun Thermometer, max. 139°, 12 M., bright sunshine 9 hrs.
Mean dew point 31.3°, mean force vapor .3456, mean humidity 52.6.
Wind, N., total movement 140 m., mean hourly vel. 5.9 m., max. pressure 3 lbs.=24 m. per hour, 11 A. M. Ozone 0.

19. Barometer reduced to 32° F., max. 29.932, min. 29.679, mean 29.803.
Temperature, max. 60°, 61°, 2 P. M., min. 33°, 27.5°, 6 A. M., mean hourly 48.3°.
Sun Thermometer, max. 143°, 12 M., bright sunshine 9 hrs.
Mean dew point 41.6°, mean force vapor .3841, mean humidity 72.6.
Wind, S.S.W., total movement 128 m., mean hourly vel. 5.3 m., max. pressure 5 1-2 lbs.=33 m. per hour, 3 P.M. Ozone 0.

20. Barometer reduced to 32° F., max. 29.738, min. 29.516, mean 29.610.
Temperature, max. 68°, 69°, 3 P.M., min. 46°, 50.5°, 12 P.M., mean hourly 57.8°.
Sun Thermometer, max. 146°, 12 M., bright sunshine 5 hrs.
Mean dew point 52.0°, mean force vapor .5025, mean humidity 80.3.
Wind, S., total movement 224 m., mean hourly vel. 9.3 m., max. pressure 6 1-4 lbs.=35 m. per hour, 7 P. M. Light shower from 9-30 P. M. to 10-30 P. M. Ozone 7.

21. Barometer reduced to 32° F., max. 30.018, min. 29.733, mean 29.884.
Temperature, max. 49°, 51°, 4 P.M., min. 33°, 34.5°, 12 P.M., mean hourly 42.2°.
Sun Thermometer, max. 110°, 2 P.M., bright sunshine 4 hrs.
Mean dew point 35.0°, mean force vapor .2685, mean humidity, 77.6.
Wind, N.N.E., total movement 159 m., mean hourly vel. 6.6 m., max. pressure 5 lbs.=32 m. per hour, 6 A. M. Light shower at 6-30 A. M., .05 in. water fell; at base of tower .06 in. Ozone 8.

22. Barometer reduced to 32° F., max. 30.101, min. 29.962, mean 30.032.
Temperature, max. 52°, 52.5°, 4 P. M., min. 28°, 21.5°, 5 A. M., mean hourly 40.3°.
Sun Thermometer, max. 137°, 1 P.M., bright sunshine 10 hrs.
Mean dew point 37.0°, mean force vapor .2770, mean humidity 76.6.
Wind, N., total movement 34 m., mean hourly vel. 1.4 m., max. pressure 1 lb.=14 m. per hour, 8 P. M. Light rain from 8-30 to 10-30 P. M., .02 in. water fell; at base of tower .03 in. Ozone 0.

23. Barometer reduced to 32° F., max. 30.195, min. 29.952, mean 30.154.
Temperature, max. 40°, 43°, 4 P.M., min, 30°, 28°, 12 P.M., mean hourly, 35.2°.
Sun Thermometer, max. 116°, 12 M., bright sunshine 4 hrs.
Mean dew point 22.0°, mean force vapor .2014, mean humidity 61.0.
Wind, N.N.E., total movement 255 m., mean hourly vel. 10.6 m., max. pressure 10 1-2 lbs.=46 m. per hour. 8 A.M. Ozone 6.

24. Barometer reduced to 32° F., max. 30.196, min. 29.950, mean 30.062.
Temperature, max. 44°, 46.5°, 2 P. M., min. 26°, 21°, 6 A. M., mean hourly 35.3°.
Sun Thermometer, max. 124°, 1 P. M., bright sunshine 9 hrs.
Mean dew point 27.0°, mean force vapor .2207, mean humidity 69.3.
Wind, N.E., total movement 172 m., mean hourly vel. 7.2 m., max. pressure 4 lbs.=28 m. per hour, 2 P. M. Ozone 1.

25. Barometer reduced to 32° F., max. 29.950, min. 29.676, mean 29.749.
Temperature, max. 50°, 52°, 2 P.M., min. 35°, 32.5°, 11 P.M., mean hourly 40.7°.
Sun Thermometer, max. 138°, 1 P.M., bright sunshine 0.
Mean dew point 32.6°, mean force vapor .2661, mean humidity 72.3.
Wind, N. E., total movement 140 m., mean hourly vel. 5.8 m., max. pressure 2 1-2 lbs.=22 m. per hour, 8 A. M., Ozone 2.

26. Barometer reduced to 32° F., max. 29.752, min. 29.692, mean 29.719.
Temperature, max. 54°, 53°, 2 P. M., min. 36°, 31°, 1 A. M., mean hourly 42.3°.
Sun Thermometer, max. 101°, 1 P. M., bright sunshine 0.
Mean dew point 42.3°, mean force vapor .3379, mean humidity 83.0.
Wind, S.W., total movement 37 m., mean hourly vel. 1.5 m., max. pressure 3-4 lb.=12 m. per hour, 12 M. Light rain began at 7 P.M. Ozone 4.

27. Barometer reduced to 32° F., max. 29.748, min. 29.331, mean 29.573.
Temperature, max. 53°, 54.5°, 12 M., min. 46°, 46°, 6 A.M., mean hourly 49.7°.
Sun Thermometer, max. 66°, 11 A.M., bright sunshine 0.
Mean dew point 48.6°, mean force vapor .3609, mean humidity 95.6.
Wind, N. E., total movement 70 m., mean hourly vel. 2.9 m., max. pressure 3 lbs.=24 m. per hour 9 P. M. Rained more or less all day; .05 in. water fell, at base of tower .06 in. Ozone 4.

28. Barometer reduced to 32° F., max. 29.483, min. 29.295, mean 29.369.
Temperature, max. 57°, 58°, 1 P. M., min. 50°, 44°, 12 M., mean hourly 53.8°.
Sun Thermometer, max. 127°, 12 M., bright sunshine 1 hr.
Mean dew point 49.0°, mean force vapor .4179, mean humidity 84.0.
Wind, S.S.W., total movement 124 m., mean hourly vel. 5.2 m., max. pressure 2 lbs.=20 m. per hour, 5 A. M. Rainy all day; 1.05 in. water fell; at base of tower 1.25 in. Ozone 5.

29. Barometer reduced to 32° F., max. 29.768, min. 29.483, mean 29.684.
Temperature, max. 49°, 57°, 1 A.M., min. 44°, 42°, 12 P.M., mean hourly 45.5°.
Sun Thermometer, max. 56°, 10 A. M., bright sunshine 0.
Mean dew point 43.3°, mean force vapor .2985, mean humidity 93.3.
Wind, N.N.E., total movement 202 m., mean hourly vel. 8.4 m., max. pressure 6 lbs.=35 m. per hour, 2 A.M. Ceased raining about 5 P.M.; 0.1 in. water fell; at base of tower .01 in. Ozone 1.

30. Barometer reduced to 32° F., max. 29.876, min. 29.768, mean 29.827.
Temperature, max. 49°, 50.5°, 1 P.M., min. 44°, 40°, 12 P. M., mean hourly 46.3°.
Sun Thermometer, max. 126°, 9 A.M., bright sunshine 0.
Mean dew point 37.3°, mean force vapor .2965, mean humidity 76.3.
Wind, N., total movement 90 m., mean hourly vel. 3.8 m., max. pressure 3 1-2 lbs.=26 m. per hour, 8 A. M. .01 in. water fell; at base of tower .02 in. Ozone 0.

31. Barometer reduced to 32° F., max. 29.899, min. 29.808, mean 29.849.
Temperature, max. 48°, 49°, 3 P.M., min. 40°, 38°, 6 A.M., mean hourly 43.5°
Sun Thermometer, max. 78°, 1 P. M., bright sunshine 0.
Mean dew point 39.0°, mean force vapor .2852, mean humidity 84.0.
Wind, N., total movement 20 m., mean hourly velocity 0.8 m., max. pressure 0. Rain began about 5 P. M. Ozone 1.

C. D. WARNER, Meteorologist.

BULLETIN No. 11. NOVEMBER, 1889.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude. 42° 23′ 48.5″ N. Longitude. 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level. 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.346; actual minimum reading 29.058; Mean reduced to 32° F., 29.742; Monthly Range, 1.288.

Air Temperature. In Degrees Fahrenheit. Highest, at top of tower, 58.0°; at base of tower, 67.0°; Lowest, at top of tower, 18.0°; at base of tower, 16.0°; Mean, 41.0°; Monthly Range, 40.0°; Highest Mean Daily, 54.2°; Lowest Mean Daily, 26.5°; Mean Maximum, 48.9°; Mean Minimum, 33.9°; Mean Daily Range, 14.7°; Greatest Daily Range, 25.0°.

Humidity. Mean Dew Point, 38.3°; Mean Force of Vapor, .3188; Mean Relative Humidity, 75.4.

Wind. Prevailing Direction, S. W.; Total Movement, 2589 miles; Greatest Daily Movement, 238 miles, 3rd; Least Daily Movement, 5 miles, 18th; Mean Daily Movement, 86.4 miles, Mean Hourly Velocity, 3.6 miles; Maximum Pressure per Square Foot 14 1-2 lbs.=54 m. per hour, 3rd, at 2 A. M.

Precipitation. In inches. Total Precipitation, 4.99 in.; at base of tower 6.04 in.

Weather. Mean Cloudiness observed, 68.0 per cent; Number of Clear Days, 6; Number of Cloudy Days, 20; Number of Fair Days, 4; Total Cloudiness recorded by the Sun Thermometer, 216 hrs, or 70.0 per cent. Number of days on which .01 inches or more rain fell, 12.

Bright Sunshine. Number of Hours Recorded, 84.

Snow, 27th and 30th.

Frost, 4th, 6th, 7th, 11th, 17th, 18th, 26th, and 29th.

Sleet, 27th.

DAILY SUMMARY.

OCT. 1. Barometer reduced to 32° F., max. 29.918, min. 29.866, mean 29.878.
*Temperature, max. 53°, 54°, 2 P.M., min. 42°, 41°, 1 A. M., mean hourly 46.8°.
Sun Thermometer, max. 76°, 10 A.M., bright sunshine 0.
Mean dew point 44.0°, mean force vapor .3322, mean humidity 87.7.
Wind, N., total movement, 8 m., mean hourly velocity 0.3. m., max. pressure, 0. Light rain from 0 A. M. to 12 M., .02 in. water fell. Ozone 2.

2. Barometer reduced to 32° F., max. 29.923, min. 29.621, mean 29.873.
Temperature, max. 55.5°, 56°, 12 P.M., min. 41.5°, 40.5°, 4 A.M., mean hrly 49.8°.
Sun Thermometer, max. 69°, 1 P.M., bright sunshine 0.
Mean dew point 46.3°, mean force vapor .3686, mean humidity 86.7.
Wind, S.S.W., total movement 45 m., mean hourly vel. 1.9 m., max. pressure 1 1-2 lbs.=17 m. per hour, 11.30 P. M. Showers from 12 M. to 12 P.M., .22 in. water fell; at base of tower .45 in. Ozone 1.

3. Barometer reduced to 32° F., max. 29.689, min. 29.430, mean 29.521.
Temperature, max. 63°, 63°, 4 A. M., min. 46°, 44°, 12 P. M., mean hourly 54.2°.
Sun Thermometer, max. 66°, 7.30 A. M., bright sunshine 0.
Mean dew point 50.7°, mean force vapor .4312, mean humidity 88.7.
Wind, S. W., total movement 238 m., mean hourly vel. 9.9 m., max. pressure 14 1-2 lbs.=54 m. per hour, 2 A.M. Showers from 0 A.M. to 7 P.M., .42 in. water fell. Ozone 7.

*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to 32° F., max. 29.877, min. 29.694, mean 29.829.
Temperature, max. 58°, 67°, 12 M., min. 38°, 32°, 7 A. M., mean hourly 47.0°.
Sun Thermometer, max. 134°, 10 A. M., bright sunshine 10 hrs.
Mean dew point 37.7°, mean force vapor .3442, mean humidity 67.7.
Wind, W.N.W., total movement 102 m., mean hourly vel. 4.3 m., max. pressure 6 1-2 lbs.=36 m. per hour, 3 P. M. Ozone 4.

5. Barometer reduced to 32° F., max. 29.929, min. 29.867, mean 29.893.
Temperature, max. 54°, 57°, 1 A. M., min. 34°, 37°, 10 P. M., mean hourly 40.8°.
Sun Thermometer, max. 70°, 10 A. M., bright sunshine 0.
Mean dew point 37.0°, mean force vapor .2734, mean humidity 64.3.
Wind, N.W., total movement 148 m., mean hourly vel. 6.2 m., max. pressure 3 3-4 lbs.=27 m. per hour, 6 A. M. Ozone 4.

6. Barometer reduced to 32° F., max. 29.872, min. 29.831, mean 29.853.
Temperature, max. 51.5°, 44°, 1 P.M., min. 32°, 30.5°, 1 A.M., mean hourly 38.7°.
Sun Thermometer, max. 111°, 10 A.M., bright sunshine 2 hrs.
Mean dew point 31.3°, mean force vapor .2343, mean humidity 56.0.
Wind, W., total movement 94 m., mean hourly vel. 3.9 m., max. pressure 3 1-4 lbs.=25 m. per hour, 1 P. M. Ozone 6.

7. Barometer reduced to 32° F., max. 29.821, min. 29.663, mean 29.737.
Temperature, max. 55°, 58°, 3 P.M., min. 30°, 28°, 5 A. M., mean hourly 43.5°.
Sun Thermometer, max. 133°, 1 P. M., bright sunshine 10 hrs.
Mean dew point 33.0°, mean force vapor .3125, mean humidity 65.3.
Wind, S. W., total movement 124 m., mean hourly vel. 5.2 m., max. pressure 4 lbs.=28 m. per hour, 1 P. M. Ozone 8.

8. Barometer reduced to 32° F., max. 29.893, min. 29.750, mean 29.857.
Temperature, max. 53°, 53°, 12 M., min. 41°, 38.5°, 1 A.M., mean hourly 46.9°.
Sun Thermometer, max. 117°, 10 A. M., bright sunshine 1 1-2 hrs.
Mean dew point 41.0°, mean force vapor .3386, mean humidity 75.3.
Wind, S.W., total movement 25 m., mean hourly vel. 1.0 m., max. pressure 1 lb.=14 m. per hour, 2 P.M. Ozone 3.

9. Barometer reduced to 32° F., max. 29.820, min. 29.576, mean 29.636.
Temperature, max. 51°, 51°, 12 M., min. 42°, 40.5°, 2 A. M., mean hourly 47.9°.
Sun Thermometer, max. 56°, 1 P. M., bright sunshine 0.
Mean dew point 49.7°, mean force vapor .4067, mean humidity 89.0.
Wind, S.S.W., total movement 52 m., mean hourly vel. 2.2 m., max. pressure 2 1-2 lbs.=22 m. per hour, 10 A.M. Rain from 5-30 A. M. to 12 M., .19 in. water fell; at base of tower .27 in. Ozone 3.

10. Barometer reduced to 32° F., max. 29.769, min. 29.618, mean 29.693.
Temperature, max. 45°, 48°, 1 A. M., min. 32°, 26°, 12 P.M., mean hourly 42.6°.
Sun Thermometer, max. 90°, 3 P.M., bright sunshine 1 1-2 hrs.
Mean dew point 40.3°, mean force vapor .3219, mean humidity 77.0.
Wind, N.N.E., total movement 137 m., mean hourly vel. 5.7 m., max. pressure 6 1-2 lbs.=36 m. per hour, 12 M. Showers from 3 A. M. to 1-30 P.M., .05 in. water fell; at base of tower .10 in. Ozone 6.

11. Barometer reduced to 32° F., max. 29.892, min. 29.802, mean. 29.845.
Temperature, max. 46.5°, 45.5°, 1 P.M., min. 34°, 29.5°, 4 A. M., mean h'rly 39.6°.
Sun Thermometer, max. 72°, 12 M., bright sunshine 0.
Mean dew point 40.3°, mean force vapor .3126, mean humidity 80.7.
Wind, S., total movement 28 m., mean hourly vel. 1.2 m., max. pressure 3-4 lb.=12 m. per hour, 1 P.M. Rainy from 8-30 A.M. to 9 P.M., .04 in. water fell; at base of tower .06 in. Ozone 6.

12. Barometer reduced to 32° F., max. 29.924, min. 29.847, mean, 29.878.
Temperature, max. 54°, 53.5°, 3 P.M., min. 43°, 41.5°, 1 A.M., mean hourly 46.3°.
Sun Thermometer, max. 81°, 3 P.M., bright sunshine 0.
Mean dew point 46.7°, mean force vapor .3600, mean humidity 88.7.
Wind, S. S. W., total movement 41 m., mean hourly vel. 1.7 m., max. pressure 3-4 lbs.=12 m. per hour, 2 P. M. Ozone 3.

13. Barometer reduced to 32° F., max. 29.843, min. 29.291, mean 29.534.
Temperature, max. 53°, 52°, 5 P.M., min. 42.5°, 42°, 1 A.M., mean hourly 47.4°.
Sun Thermometer, max. 61°, 10 A.M., bright sunshine 0.
Mean dew point 50.3°, mean force vapor .4126, mean humidity 87.7.

Wind, N.N.E., total movement 45 m., mean hourly vel. 1.9 m., max. pressure 1 lb.=14 m. per hour, 10-30 P. M. Rain from 12-30 P. M. to 8 P. M., .50 in. water fell; at base of tower .58 in. Ozone 4.

14. Barometer reduced to 32° F., max. 29.432, min. 29.296, mean 29.375.
Temperature, max. 56°, 57°, 11 A. M., min. 36°, 41°. 12 P.M., mean hourly 50.1.°
Sun Thermometer, max. 135°, 9 A.M., bright sunshine 3 1-2 hrs.
Mean dew point 45.3°, mean force vapor .3967, mean humidity 76.7.
Wind, N.W., total movement 96 m., mean hourly vel. 4.0 m., max. pressure 7 3-4 lbs.=39 m. per hour, 12 M. Ozone 4.

15. Barometer reduced to 32° F., max. 30.118, min. 29.465, mean 29.829.
Temperature. max. 43°, 40°, 1 A. M., min. 18°, 15°, 12 P.M., mean hourly 34.6°.
Sun Thermometer, max. 107°, 12 M., bright sunshine 7 hrs.
Mean dew point 29.0°, mean force vapor .1940, mean humidity 75.3.
Wind, N. W., total movement 225 m., mean hourly vel. 9.4 m., max. pressure 11 lbs.=47 m. per hour, 10 A.M. Ozone 8.

16. Barometer reduced to 32° F., max. 30.369, min. 30.322, mean 30.309.
Temperature, max. 35°, 35°, 4 P.M., min. 20°, 16°, 5 A.M., mean hourly 26.5°.
Sun Thermometer, max. 107°, 1-30 P. M., bright sunshine 10 hrs.
Mean dew point 24.0°, mean force vapor .1916, mean humidity 68.7.
Wind, N., total movement 45 m., mean hourly vel. 1.9 m., max. pressure 1 lb.=14 m. per hour, 9-30 A. M. Ozone 1.

17. Barometer reduced to 32° F., max. 30.350, min. 30.052, mean 30.161.
Temperature, max. 45°, 50°, 3 P. M., min. 20°, 18°, 7 A. M., mean hourly 31.1°.
Sun Thermometer, max. 132°, 1 P.M., bright sunshine 10 hrs.
Mean dew point 24.0°, mean force vapor .2219, mean humidity 61.3.
Wind, S.S.W., total movement 19 m., mean hourly vel. .8 m., max. pressure 1 1-2 lbs.=17 m. per hour, 1-30 P. M. Ozone 0.

18. Barometer reduced to 32° F., max. 30.053, min. 29.900, mean 29.938.
Temperature, max. 46°, 48°, 3 P.M., min. 26°, 24°, 4 A.M., mean hourly 36.7°.
Sun Thermometer, max. 80°, 1-30 P.M., bright sunshine 0.
Mean dew point 30.7°, mean force vapor .2745, mean humidity 62.0.
Wind, S.E., total movement 5 m., mean hourly vel. .2 m., max. pressure 1-2 lb.=10 m. per hour, 10 A. M. Ozone 4.

19. Barometer reduced to 32° F., max. 29.956, min. 29.504, mean 29.693.
Temperature. max. 49°, 50.5°, 11 A.M., min. 42°, 41°, 1 A. M., mean hourly 44.1°.
Sun Thermometer, max. 70°, 11-30 P.M., bright sunshine 0.
Mean dew point 44.3°, mean force vapor .3191, mean humidity 91.3.
Wind, N.N.E., total movement 164 m., mean hourly vel. 6.8 m., max. pressure 7 1-2 lbs.=39 m. per hour, 11 A.M. Showers from 3-30 P.M. to 10-30 P.M., .35 in. water fell; at base of tower .51 in. Ozone 0.

20. Barometer reduced to 32° F., max. 29.493, min. 29.343, mean 29.383.
Temperature, max. 53.5°, 50°, 2 P.M., min. 39°, 36.5°, 11 P.M., mean hourly 47.2°.
Sun Thermometer, max. 117°, 1 P.M., bright sunshine 1 hr.
Mean dew point 45.7°, mean force vapor .4060. mean humidity 77.3.
Wind, S.W., total movement 96 m., mean hourly vel. 4.0 m., max. pressure 3 lbs.=24 m. per hour, 3 P. M. Showers from 3 A. M. to 9-30 P. M., .20 in. water fell; at base of tower .27 in. Ozone 7.

21. Barometer reduced to 32° F., max. 29.417, min. 29.132, mean 29.313.
Temperature, max. 52°, 52.5°, 2 P.M., min. 41°, 40°, 6 A.M., mean hourly 45.3°.
Sun Thermometer, max. 129°, 12 M., bright sunshine 4 1-2 hrs.
Mean dew point 44.3°, mean force vapor .3969, mean humidity, 75.3.
Wind, S.S.W., total movement 93 m., mean hourly vel. 3.9 m., max. pressure 2 1-2 lbs.=22 m. per hour, 5 P.M. Showers from 0 A.M., to 12 P.M., .38 in. water fell; at base of tower .52 in. Ozone 0.

22. Barometer reduced to 32° F., max. 29.102, min. 29.011, mean 29.037.
Temperature, max. 49°, 50°, 2 P. M., min. 41°, 40°, 2 A. M., mean hourly 45.6°.
Sun Thermometer, max. 66°, 10-30 A.M., bright sunshine 0.
Mean dew point 44.7°. mean force vapor .3423, mean humidity 88.0.
Wind, S.W., total movement 53 m.. mean hourly vel. 2.2 m., max. pressure 1 1-2 lbs.=17 m. per hour, 1 A. M. Light showers from 0 A. M. to 7 A. M., Ozone 6.

23. Barometer reduced to 32° F., max. 29.738, min. 29.041, mean 29.452.
Temperature, max. 48.5°,49.5°, 4 P.M., min. 38°, 35°, 12 P.M., mean hourly, 46.8°.
Sun Thermometer, max. 72°, 9 A.M., bright sunshine 0.
Mean dew point 42.0°, mean force vapor .3512, mean humidity 75.7.
Wind, N.W., total movement 84 m., mean hourly vel. 3.5 m., max. pressure 6 lbs.=35 m. per hour, 8 P.M. Ozone 0.

24. Barometer reduced to 32° F., max. 29.908, min. 29.760, mean 29.848.
Temperature, max. 49.5°, 51.5°, 3 P.M., min. 36°, 35°, 4 A.M., mean hourly 44.9°.
Sun Thermometer, max. 124°, 12 M., bright sunshine 2 hrs.
Mean dew point 39.7°, mean force vapor .3945, mean humidity 63.3.
Wind, W.N.W., total movement 85 m., mean hourly vel. 3.5 m., max. pressure 2 lbs.=20 m. per hour, 7 P. M. Ozone 0.

25. Barometer reduced to 32° F., max. 30.106, min. 29.826, mean 29.917.
Temperature, max. 49°, 41.5°, 7 A.M., min. 26°, 21.5°, 12 P.M., mean hourly 42.1°.
Sun Thermometer, max. 57°, 11-30 A.M., bright sunshine 0.
Mean dew point 35.3°, mean force vapor .2930, mean humidity 70.7.
Wind, N., total movement 73 m., mean hourly vel. 3.0 m., max. pressure 2 1-4 lbs.=21 m. per hour, 9 P. M., Ozone 2.

26. Barometer reduced to 32° F., max. 30.335, min. 30.128, mean 30.278.
Temperature, max. 39°, 42.5°, 2 P.M., min. 26°, 21°, 5 A.M., mean hourly 33.2°.
Sun Thermometer, max. 111°, 11-30 A. M., bright sunshine 9 1-2 hrs.
Mean dew point 26.3°, mean force vapor .2921, mean humidity 50.7.
Wind, N.N.W., total movement 43 m., mean hourly vel. 1.8 m., max. pressure 2 1-2lbs.=22 m. per hour, 10 A.M. Ozone 0.

27. Barometer reduced to 32° F., max. 30.336, min. 29.763, mean 30.129.
Temperature, max. 42°, 44.5°, 1 P.M., min. 29°, 27.5°, 1 A.M., mean hourly 32.4°.
Sun Thermometer, max. 45°, 11 A.M., bright sunshine 0.
Mean dew point 30.3°, mean force vapor .2577, mean humidity 68.7.
Wind, E.S.E., total movement 38 m., mean hourly vel. 1.6 m., max. pressure 1 1-2 lbs.=17 m. per hour 6 P. M. Began storming at 2 P.M.—Snow, sleet and rain—ended 12 P.M., 2.26 in. water fell. Ozone 0.

28. Barometer reduced to 32° F., max. 29.715, min. 29.090, mean 29.266.
Temperature, max. 44°, 48°, 3 P. M., min. 30°, 28°, 1 P.M., mean hourly 42.9°
Sun Thermometer, max. 121°, 1-30 P.M., bright sunshine 1 hr.
Mean dew point 41.0°, mean force vapor .3227, mean humidity 81.7.
Wind, N., total movement 130 m., mean hourly vel. 5.4 m., max. pressure 8 lbs.=40 m. per hour, 4-30 A.M. Rained from 0 A.M. to 5 P. M., .36 in. water fell; at base of tower .58 in. Ozone 7.

29. Barometer reduced to 32° F., max. 29.571, min. 29.341, mean 29.445.
Temperature, max. 40°, 42°, 12 M., min. 28°, 26.5°, 12 P.M., mean hourly 34.5°.
Sun Thermometer, max. 114°, 12 M., bright sunshine 5 hrs.
Mean dew point 32.7°, mean force vapor .2715, mean humidity 71.0.
Wind, S.W., total movement 111 m., mean hourly vel. 4.6 m., max. pressure 7 lbs.=37 m. per hour, 11-30 A. M. Ozone 5.

30. Barometer reduced to 32° F., max. 30.098, min. 29.585, mean 29.912.
Temperature, max. 34°, 35°, 1 A.M., min. 22°, 16.5°, 12 P.M., mean hourly 28.9°.
Sun Thermometer, max. 96°, 12 M., bright sunshine 5 hrs.
Mean dew point 30.0°, mean force vapor .1898, mean humidity 88.7.
Wind, N.N.W., total movement 142 m., mean hourly vel. 5.9 m., max. pressure 8 1-4 lbs.=41 m. per hour, 8 A. M. Slight snow squall in the morning. Ozone 8.

C. D. WARNER, Meteorologist.

BULLETIN No. 12. DECEMBER, 1889.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.64; actual minimum reading 28.915; Mean reduced to 32° F., 29.829; Monthly Range, 1.725.

Air Temperature. In Degrees Fahrenheit. Highest, at top of tower, 64.0°; at base of tower, 64.0°; Lowest, at top of tower, 4.0°; at base of tower, 3.5°; Mean, 35.0°; Monthly Range, 60.0°; Highest Mean Daily, 53.5°; Lowest Mean Daily, 11.8°; Mean Maximum, 44.8°; Mean Minimum, 24.2°; Mean Daily Range, 20.5°; Greatest Daily Range, 36.0°.

Humidity. Mean Dew Point, 30.9°; Mean Force of Vapor, .2406; Mean Relative Humidity, 75.2.

Wind. Prevailing Direction, N. W.; Total Movement, 4445 miles; Greatest Daily Movement, 337 miles, 27th; Least Daily Movement, 19 miles, 18th; Mean Daily Movement, 143.4 miles, Mean Hourly Velocity, 5.9 miles; Maximum Pressure per Square Foot 29 lbs.=76 m. per hour, 26th, at 4-30 P. M.

Precipitation. In inches. Total Precipitation, 2.59 in.; at base of tower 3.57 in.

Weather. Mean Cloudiness observed, 61.0 per cent; Number of Clear Days, 9; Number of Cloudy Days, 18; Number of Fair Days, 4; Total Cloudiness recorded by the Sun Thermometer, 179 hrs, or 66.0 per cent. Number of days on which .01 inches or more rain fell, 12.

Bright Sunshine. Number of Hours Recorded, 108.

Snow, 5th, 14th and 26th. Total fall; in inches, 6 3-4.

Frost, 1st, 10th, 22nd, 29th, and 31st.

Halos, Lunar, 30th. ***Meteors,*** 19th. ***Gale,*** 26th.

DAILY SUMMARY.

DEC. 1. Barometer reduced to 32° F., max. 30.218, min. 30.025, mean 30.132.
*Temperature, max. 45°, 48°, 3 P.M., min. 22°, 16°, 6 A. M., mean hourly 33.0°.
Sun Thermometer, max. 121°, 1.30 P.M., bright sunshine 9 hrs.
Mean dew point 32.7°, mean force vapor .2590, mean humidity 66.7.
Wind, S.W., total movement, 63 m., mean hourly velocity 2.6. m., max. pressure. 2 lbs.= 20 m. per hour, 12 M. Ozone 2.

2. Barometer reduced to 32° F., max. 30.020, min. 29.673, mean 29.745.
Temperature, max. 49°, 50°, 11 A.M., min. 30°, 27°, 2 A.M., mean hourly 41.0°.
Sun Thermometer, max. 126°, 11.30 A. M., bright sunshine 3 1-2 hrs.
Mean dew point 35.0°, mean force vapor .2910, mean humidity 63.3.
Wind, W., total movement 226 m., mean hourly vel. 9.4 m., max. pressure 11 1-2 lbs.=48 m. per hour, 11.30 A.M. Ozone 4.

3. Barometer reduced to 32° F., max. 30.955, min. 29.622, mean 29.762.
Temperature, max. 46.5°, 45.5°, 1 A.M., min. 4°, 3.5°, 12 P.M., mean hourly 31.2°.
Sun Thermometer, max. 45°, 1 P.M., bright sunshine 0.
Mean dew point 21.3°, mean force vapor .2576, mean humidity 69.0.
Wind, N.N.E., total movement 229 m., mean hourly vel. 9.5 m., max. pressure 13 lbs.=51 m. per hour, 4 P.M. Ozone 4.

*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to 32° F., max. 30.255. min. 30.053, mean 30.240.
Temperature, max. 18°. 23°. 4 P.M.. min. 5°. 3.5°. 7 A.M., mean hourly 11.8°.
Sun Thermometer, max. 94°. 1 P. M., bright sunshine 9 hrs.
Mean dew point 10.0°. mean force vapor .0761. mean humidity 82.7.
Wind. N.W.E., total movement 206 m., mean hourly vel. 8.6 m.. max. pressure 11 lbs.=47 m. per hour. 0 A. M. Ozone 6.

5. Barometer reduced to 32° F., max. 30.210. min. 29.690, mean 29.985.
Temperature. max. 38°. 37°, 9 P. M., min. 15°, 13°. 1 A. M.. mean hourly 24.1°.
Sun Thermometer, max. 35°, 9 P. M., bright sunshine 0.
Mean dew point 28.3°, mean force vapor .1466. mean humidity 90.3.
Wind, S.S.W., total movement 37 m., mean hourly vel. 1.5 m., max. pressure 2 lbs.=20 m. per hour, 8 P. M. Stormy from 9 A.M. to 11 P.M., snow and rain. Total precipitation 0.11 in.: at base of tower, 0.12 in. Ozone 3

6. Barometer reduced to 32° F.. max. 29.745, min. 29.628, mean 29.671.
Temperature, max. 46°. 40.5°, 10 A.M.. min. 17°, 20°, 12 P.M., mean hourly 35.0°.
Sun Thermometer. max. 112°, 1-30 P.M., bright sunshine 2 hrs.
Mean dew point 28.7°, mean force vapor .2790, mean humidity 64.3.
Wind, N.N.W.. total movement 115 m.. mean hourly vel. 4.8 m.. max. pressure 7 lbs.=37 m. per hour. 12 M. Light shower from 6 A. M. to 6-30 A. M Ozone 1.

7. Barometer reduced to 32° F., max. 29.758, min. 29.634, mean 29.704.
Temperature. max. 51°, 49.5°. 2 P.M., min. 25.5°. 23°. 2 A.M., mean hourly 35.6°.
Sun Thermometer. max. 120°, 1 P.M.. bright sunshine 9 hrs.
Mean dew point 32.3°. mean force vapor .2101. mean humidity 82.0.
Wind. S.S.W., total movement 125 m.. mean hourly vel. 5.2 m.. max. pressure 1 3-4 lbs.=18 m. per hour, 1 P.M. Ozone 0.

8. Barometer reduced to 32° F.. max. 29.933, min. 29.681. mean 29.861.
Temperature. max. 56°. 58°. 12 P.M., min. 25.5°. 23°, 7 A.M.. mean hourly 37.3°.
Sun Thermometer. max. 87°. 10-30 A.M., bright sunshine 0.
Mean dew point 37.3°, mean force vapor .2753. mean humidity 79.7.
Wind. S., total movement 58 m., mean hourly vel. 2 4 m., max. pressure 9 3-4 lbs.=44 m. per hour. 12 P.M. Began raining at 5 P.M. Ozone 0.

9. Barometer reduced to 32° F.. max. 29.911. min. 29.610, mean 29.743.
Temperature. max. 60°. 60°. 2 P.M.. min. 32°. 27°. 12 P. M., mean hourly 53.5°.
Sun Thermometer, max. 136°. 1 P.M., bright sunshine 8 hrs.
Mean dew point 48.0°. mean force vapor .4331, mean humidity 79.3.
Wind. W.. total movement 190 m.. mean hourly vel. 7.9 m., max. pressure 12 lbs.=49 m. per hour. 1-30 A.M. Stopped raining at 9 A.M. .75 in. water fell; at base of tower 1.40 in. Ozone 7.

10. Barometer reduced to 32° F., max. 30.134, min. 29.911, mean 30.087.
Temperature. max. 44°. 48.5°. 1 P.M.. min. 32°, 27°. 7 A.M., mean hourly 38.9°.
Sun Thermometer. max. 115°. 1-30 P.M., bright sunshine 8 hrs.
Mean dew point 30.0°. mean force vapor .2482. mean humidity 68.0.
Wind, N.N.E., total movement 82 m., mean hourly vel. 3.4 m., max. pressure 7 lbs.=37 m. per hour. 10 A.M. Shower from 11 P. M. to 11-30 P. M., .01 in. water fell; at base of tower .02 in. Ozone 1.

11. Barometer reduced to 32° F., max. 30.030. min. 29.449. mean 29.576.
Temperature, max. 47.5°, 46.5°. 4 P.M., min. 32°, 34°. 1 A. M., mean hourly 40.0°.
Sun Thermometer. max. 99°, 1 P.M., bright sunshine 1 hr.
Mean dew point 38.7°. mean force vapor .2935, mean humidity 80.7.
Wind. N.N.W., total movement 104 m., mean hourly vel. 4.3 m., max. pressure 16 lbs.=57 m. per hour. 8.30 P.M. Rain from 7 A.M. to 2 P.M.. .28 in. water fell; at base of tower .34 in. Ozone 5.

12. Barometer reduced to 32° F.., max. 29.847. min. 29.567, mean 29.727.
Temperature, max. 47°, 45°. 2 P.M., min. 34.5°. 31°, 12 P.M., mean hourly 40.6°.
Sun Thermometer, max. 112°, 12-30 P.M., bright sunshine 9 hrs.
Mean dew point 28.7°. mean force vapor .2676, mean humidity 59.3.
Wind, N.N.W., total movement 276 m.. mean hourly vel. 11.5 m.. max. pressure 12 1-2 lbs.=50 m. per hour, 1 A. M. Ozone 5.

13. Barometer reduced to 32° F., max. 29.847. min. 29.458, mean 29.615.
Temperature. max. 58°. 51.5°. 2 P.M.. min. 22°. 20°. 12 P.M.. mean hourly 39.2°.

Sun Thermometer, max. 96°, 11-30 A.M., bright sunshine 1 hr.
Mean dew point 32.3°, mean force vapor .2935, mean humidity 63.3.
Wind, N.W., total movement 230 m., mean hourly vel. 9.6 m., max. pressure 16 1-4 lbs.=57 m. per hour, 3-30 P. M. Ozone 0.

14. Barometer reduced to 32° F., max. 30.044, min. 29.870, mean 29.947.
Temperature, max. 35°, 36°, 10 A. M., min. 16°, 14°, 8 P.M., mean hourly 22.9.°
Sun Thermometer, max. 28°, 9-30 A.M., bright sunshine 0.
Mean dew point 18.7°, mean force vapor .1305, mean humidity 79.3.
Wind, N.N.E., total movement 183 m., mean hourly vel. 7.6 m., max. pressure 9 1-2 lbs.=44 m. per hour, 9 P.M. Began snowing at 1-30 P.M.; ceased about 8 P.M. 5 1-2 in. snow fell. Ozone 6.

15. Barometer reduced to 32° F., max. 30.063, min. 29.916, mean 29.990.
Temperature, max. 30°, 27.5°, 3 P.M., min. 16.5°, 14°, 3 A.M., mean hourly 22.6°.
Sun Thermometer, max. 106°, 10-30 A.M., bright sunshine 4 hrs.
Mean dew point 22.7°, mean force vapor .1609, mean humidity 77.3.
Wind, S.S.W., total movement 71 m., mean hourly vel. 3.0 m., max. pressure 0. Ozone 7.

16. Barometer reduced to 32° F., max. 30.041, min. 29.699, mean 29.992.
Temperature, max. 37.5°, 42°, 4 P. M., min. 22°, 17°, 1 A. M., mean hourly 29.8°.
Sun Thermometer, max. 135°, 1 P. M., bright sunshine 8 1-2 hrs.
Mean dew point 29.3°, mean force vapor .2110, mean humidity 79.0.
Wind, S.S.E., total movement 56 m., mean hourly vel. 2.3 m., max. pressure 3-4 lb.=12 m. per hour, 12 P.M. Ozone 7.

17. Barometer reduced to 32° F., max. 30.020, min. 29.963, mean 29.980.
Temperature, max. 38.5°, 36.5°, 2 P.M., min. 28°, 24°, 9 A.M., mean hourly 34.3°.
Sun Thermometer, max. 57°, 11 A.M., bright sunshine 0.
Mean dew point 32.3°, mean force vapor .2212, mean humidity 84.7.
Wind, E.N.E., total movement 67 m., mean hourly vel. 2.8 m., max. pressure 1 lb.=14 m. per hour, 1-30 A. M. Ozone 0.

18. Barometer reduced to 32° F., max. 30.042, min. 29.880, mean 29.990.
Temperature, max. 40°, 37°, 12 M., min. 35°, 32°, 3 A.M., mean hourly 36.1°.
Sun Thermometer, max. 46°, 12 M., bright sunshine 0.
Mean dew point 38.0°, mean force vapor .2436, mean humidity 93.3.
Wind, N.E., total movement 19 m., mean hourly vel. 0.8 m., max. pressure 0. Began raining at 1 A.M.; showers during the day. Ozone 4.

19. Barometer reduced to 32° F., max. 29.880, min. 29.604, mean 29.645.
Temperature, max. 48°, 48°, 3 P.M., min. 35.5°, 30°, 1 A. M., mean hourly 40.4°.
Sun Thermometer, max. 105°, 3-30 P.M., bright sunshine 1 1-2 hrs.
Mean dew point 40.0°, mean force vapor .2968, mean humidity 80.0.
Wind, N.W., total movement 22 m., mean hourly vel. 0.9 m., max. pressure 1 1-2 lbs.=17 m. per hour, 7 P.M. Ceased raining at 7 A.M., .33 in. rain fell; at base of tower .38 in. Ozone 0.

20. Barometer reduced to 32° F., max. 29.683, min. 29.353, mean 29.541.
Temperatnre, max. 55°, 53 , 2 P.M., min. 33°, 29°, 9 A.M., mean honrly 44.6°.
Sun Thermometer, max. 124°, 2 P.M., bright sunshine 3 1-2 hrs.
Mean dew point 43.0°, mean force vapor .3356, mean humidity 86.7.
Wind, S.S.W., total movement 124 m., mean hourly vel. 5.2 m., max. pressure 4 1-4 lbs.=39 m. per hour, 1-30 P. M. Ozone 0.

21. Barometer reduced to 32° F., max. 29.991, min. 29.348, mean 29.853,
Temperature, max. 54.5°, 52°, 1 A.M., min. 26°, 27°, 12 P.M., mean hourly 40.6°.
Sun Thermometer, max. 104°, 12 P.M., bright sunshine 7 hrs.
Mean dew point 32.3°, mean force vapor .2351, mean humidity, 77.7.
Wind, N.W., total movement 221 m., mean hourly vel. 9.2 m., max. pressure 8 lbs=40 m. per hour, 12-30 P. M. Ozone 6.

22. Barometer reduced to 32° F., max. 29.996, min. 29.668, mean 29.778.
Temperature, max. 43°, 41°, 12 P. M., min. 27°, 26°, 4 A. M., mean hourly 32.5°.
Sun Thermometer, max. 31°, 3 P.M., bright sunshine 0.
Mean dew point 33.3°, mean force vapor .2166, mean humidity 88.3.
Wind, N.W., total movement 89 m., mean hourly vel. 3.7 m., max. pressure 24 lbs.=70 m. per hour, 11 P. M. Began raining about 9 A. M.; stopped 12 P. M., .24 in. water fell; at base of tower .31 in. Ozone 3.

23. Barometer reduced to 32° F., max. 30.245, min. 29.662, mean 29.983.
Temperature, max. 43°, 43°, 2 P. M., min. 27.5°, 24°, 12 P. M., mean hourly, 37.5°.
Sun Thermometer, max. 111°, 1 P.M., bright sunshine 9 hrs.
Mean dew point 28.0°, mean force vapor .2266, mean humidity 68.7.
Wind, N.N.W., total movement 228 m., mean hourly vel. 9.5 m., max. pressure 14 1-2 lbs.=50 m. per hour, 0 A.M. Ozone 9.

24. Barometer reduced to 32° F., max. 30.253, min. 29.810, mean 30.058.
Temperature. max. 43.5°, 40.5°, 3 P.M., min. 28°, 25°, 1 A.M., mean hourly 34.2°.
Sun Thermometer, max. 42°. 2 P. M., bright sunshine 0.
Mean dew point 33.3°, mean force vapor .2365, mean humidity 83.3.
Wind, S.E., total movement 78 m., mean hourly vel. 3.3 m., max. pressure 2 lbs.=20 m. per hour, 12 M. Showers from 3 P. M. to 12 P. M. Ozone 0.

25. Barometer reduced to 32° F., max. 29.810, min. 29429, mean 29.513.
Temperature, max 64°, 64°, 3 P. M., min. 34°, 33°, 1 A.M., mean hourly 48.2°.
Sun Thermometer, max. 134°, 1-30 P.M., bright sunshine 9 hrs.
Mean dew point 48.7°, mean force vapor .4090, mean humidity 88.7.
Wind, S.W., total movement 224 m., mean hourly vel. 9.3 m., max. pressure 9 1-2 lbs.=44 m. per hour, 1-30 P. M. Stopped raining at 7 A. M., .38 in. water fell; at base of tower .44 in. Ozone 1.

26. Barometer reduced to 32° F., max. 29.516, min. 28.867, mean 29.107.
Temperature, max. 49°, 49°, 1 P M., min. 27°, 25°, 12 P. M., mean hourly 39.7°.
Sun Thermometer, max. 89°, 2-30 P. M., bright sunshine 2 hrs.
Mean dew point 28.7°, mean force vapor .3414, mean humidity 60.0.
Wind, N.W., total movement 310 m., mean hourly vel. 15 m., max. pressure 29 lbs.=76 m. per hour, 4-30 P.M. Light rain during forenoon, .01 in. water fell; at base of tower .02 in. Ozone 4. Snow squall at 6 P. M.

27. Barometer reduced to 32° F., max. 29.143, min. 28.566, mean 29.405.
Temperature, max. 35°. 35°, 12 M., min. 22°, 20.5°, 4 A.M., mean hourly 38.4°.
Sun Thermometer, max. 120°, 12 M., bright sunshine 9 hrs.
Mean dew point 22.0°, mean force vapor .1813, mean humidity 67.3.
Wind, N.N.W., total movement 337 m., mean hourly vel. 17 m., max. pressure 13 lbs.=51 m. per hour, 7 P. M. Ozone 7.

28. Barometer reduced to 32° F., max. 29.872, min. 29.851, mean 29.744.
Temperature, max. 45°, 42.5°, 2 P. M., min. 22°, 19.5°, 5 A.M., mean hourly 33.0°
Sun Thermometer, max. 108°, 10-30 A.M., bright sunshine 4 hrs.
Mean dew point 24.3°, mean force vapor .2066, mean humidity 68.3.
Wind, S., total movement 57 m., mean hourly vel. 2.4 m., max. pressure 0. Ozone 0.

29. Barometer reduced to 32° F., max. 30.230, min. 29.510, mean 29.811.
Temperature, max. 47°.42.5°, 12 P.M., min. 22°, 21.5°, 7 A.M., mean hourly 28.9°.
Sun Thermometer, max. 28°, 1 P.M., bright sunshine 0.
Mean dew point 28.0°, mean force vapor .1797, mean humidity 86.3.
Wind, N.W., total movement 49 m., mean hourly vel. 2 m., max. pressure 1 1-2 lbs.=18 m. per hour, 11 P. M. Began raining at 9 A. M.; stopped at 3 P.M., .04 in. water fell; at base of tower .05 in. Ozone 4.

30. Barometer reduced to 32° F., max. 30.297, min. 29.294, mean 29.956.
Temperature. max. 46°. 45.5°, 4 A.M., min. 17°, 15°. 12 P.M., mean hourly 36.4°.
Sun Thermometer, max. 85°, 9 A. M., bright sunshine 1 hr.
Mean dew point 22.3°, mean force vapor .2029, mean humidity 62.7.
Wind, N.W., total movement 240 m., mean hourly vel. 10m., max. pressure 12 lbs.=49 m. per hour, 7 A. M. Ozone 1.

31. Barometer reduced to 32° F., max. 30.650, min. 30.302, mean 30.570.
Temperature. max. 28°, 29°, 3 P. M., min. 17°. 16°. 7 A. M., mean hourly 24.2°.
Sun Thermometer, max. 91°. 12-30 P. M., bright sunshine 9 hrs.
Mean dew point 8.3°. mean force vapor .1315. mean humidity 50.7.
Wind, N.N.E., total movement 129 m., mean hourly vel. 5.4 m., max. pressure 4 lbs=28 m. per hour. 9 A. M. Ozone 0.

C. D. WARNER, Meteorologist.

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BULLETIN No. 13. JANUARY, 1890

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 18.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.64; actual minimum reading 29.14; Mean reduced to sea level, 30.191; Monthly Range, 1.50.

Air Temperature. In Degrees Fahrenheit. Highest, at top of tower, 64°; at base of tower, 61.5°; Lowest, at top of tower, 10°; at base of tower, 4.5°; Mean, 33.2°; Monthly Range, 54°; Highest Mean Daily, 52.3°; Lowest Mean Daily, 15.9°; Mean Maximum, 40.9°; Mean Minimum, 21.1°; Mean Daily Range, 19.6°; Greatest Daily Range, 34°.

Humidity. Mean Dew Point, 23.8°; Mean Force of Vapor, .2042; Mean Relative Humidity, 68.2.

Wind. Prevailing Direction, E.S.E.; Total Movement, 4914 miles; Greatest Daily Movement, 345 miles, 9th; Least Daily Movement, 26 miles, 12th; Mean Daily Movement, 158.5 miles, Mean Hourly Velocity, 6.6 miles; Maximum Pressure per Square Foot 27 3-4 lbs.=74 m. per hour, 8th, at 3 P. M.

Precipitation. In inches. Total Precipitation, 2.37 in.; at base of tower 2.61 in.

Weather. Mean Cloudiness observed, 52 per cent; Number of Clear Days, 7; Number of Cloudy Days, 6; Number of Fair Days, 18; Total Cloudiness recorded by the Sun Thermometer, 185 hrs, or 63 per cent. Number of days on which .01 inches or more rain fell, 14.

Bright Sunshine. Number of Hours Recorded, 112 1-2.

Snow, 1sh, 8th, 10th, 11th, 16th, 21st, 23rd, 27th. Total fall, in inches, 4 1-2.

Sleet, 27th.

Halos, Lunar, 4th, 5th.

DAILY SUMMARY.

JAN. 1. Barometer reduced to sea level max. 30.94, min. 30.57, mean 30.792.
*Temperature, max. 52°, 52°, 12 P.M., min. 25°, 24°, 2 A. M., mean hourly 30.7°.
Sun Thermometer, max. 43°, 11 A.M., bright sunshine 0.
Mean dew point 30.7°, mean force vapor .2019, mean humidity 86.7.
Wind, N.W., total movement, 39 m., mean hourly velocity 1.6. m., max. pressure, 2 2-3 lbs.= 23 m. per hour, 10 P.M. An inappreciable fall of snow during forenoon. Showers from 2 P.M. to 9 P.M., .02 inches water fell; at base of tower, .03. Ozone 3.

2. Barometer reduced to sea level, max. 30.54, min. 30.18, mean 30.28.
Temperature, max. 64°, 61.5°, 2 P.M., min. 38°, 34°, 12 P.M., mean hourly 52.3°.
Sun Thermometer, max. 69°, 12.30 A.M., bright sunshine 0.
Mean dew point 47.0°, mean force vapor .4471, mean humidity 72.0.
Wind, S.S.W., total movement 274 m., mean hourly vel. 11.4 m., max. pressure 11 1-2 lbs.=48 m. per hour, 4 P.M. Ozone 6.

3. Barometer reduced to sea level, max. 30.615, min. 30.29, mean 30.537.
Temperature, max. 41°, 50°, 1 A.M., min. 20°, 17°, 12 P.M., mean hourly 37.4°.
Sun Thermometer, max. 104°, 11.30 A.M., bright sunshine 2 1-2 hrs.
Mean dew point 22°, mean force vapor .2288, mean humidity 51.7.
Wind, N.W., total movement 244 m., mean hourly vel. 10.3 m., max. pressure 8 1-2 lbs.=41 m. per hour, 1 A.M. Ozone 7.

*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to sea level, max. 30.73, min. 30.43, mean 30.592.
Temperature, max. 39°, 36.5°, 3 P.M., min. 21.5°, 16°, 7 A.M., mean hourly 29.0°.
Sun Thermometer, max. 105°, 1.30 P. M., bright sunshine 9 hrs.
Mean dew point 19.0°, mean force vapor .1718, mean humidity 63.7.
Wind, S.S.W., total movement 86 m., mean hourly vel. 3.6 m., max. pressure 3 lbs.=24 m. per hour, 12 P. M. Ozone 0.

5. Barometer reduced to sea level, max. 30.430, min. 29.93, mean 30.105.
Temperature, max. 51°, 45°, 3 P. M., min. 36°, 35°, 1 A. M., mean hourly 39.6°.
Sun Thermometer, max. 76°, 2 P.M., bright sunshine 0.
Mean dew point 39.3°, mean force vapor .2675, mean humidity 89.7.
Wind, S.S.W., total movement 206 m., mean hourly vel. 8.6 m., max. pressure 4 1-2 lbs.=30 m. per hour. 3 A. M. Began raining at 5 A.M. Stopped at 7.30 A.M., .08 in. water fell; at base of tower. .10 in. Ozone 0.

6. Barometer reduced to sea level, max. 29.92, min. 29.655, mean 29.765.
Temperature, max. 59°, 58.5°, 8 P.M., min. 37.5°, 36°, 1 A.M., mean hourly 52.3°.
Sun Thermometer, max. 72°, 2 P.M., bright sunshine 0.
Mean dew point 47.0°, mean force vapor .4078, mean humidity 79.7.
Wind, S.S.W., total movement 225 m., mean hourly vel. 9.4 m., max. pressure 13 lbs.=51 m. per hour, 8 P. M. Showers from 1.30 A. M. to 9 P. M , .04 in. water fell; at base of tower, .07 in. Ozone 2.

7. Barometer reduced to sea level, max. 29.99, min. 29.795, mean 29.960.
Temperature, max. 43°, 50.5°, 1 A.M., min. 29.5°, 26°, 12 P.M.. mean hourly 52.3°.
Sun Thermometer, max. 55°, 1 P.M.. bright sunshine 0.
Mean dew point 23.0°, mean force vapor .2205. mean humidity 57.0.
Wind, N.W., total movement 160 m., mean hourly vel. 6.7 m., max. pressure 1-4 lbs.=7 m. per hour, 3 A.M. Ozone 5.

8. Barometer reduced to sea level, max. 29.99. min. 29.44, mean 29.652.
Temperature, max. 43°, 39°, 1 A.M., min. 16°, 13.5°, 12 P.M., mean hourly 33.7°.
Sun Thermometer, max. 105°, 10-30 A.M., bright sunshine 3 hrs.
Mean dew point 25.7°, mean force vapor .2085, mean humidity 66.7.
Wind, W.S.W., total movement 93 m., mean hourly vel. 3 9 m., max. pressure 12 3-4 lbs.=50 m. per hour, 11-30 P.M. An inappreciable quantity of snow fell in the later part of the afternoon. Ozone 0.

9. Barometer reduced to sea level, max. 29.98, min. 29.45, mean 29.903.
Temperature, max. 32°, 33°, 1 A.M., min. 14°, 13.5°, 7 A.M., mean hourly 21.6°.
Sun Thermometer, max. 78°, 10 A.M., bright sunshine 9 hrs.
Mean dew point 5.3°, mean force vapor .1214, mean humidity 47.7.
Wind, W.N.W., total movement 345 m., mean hourly vel. 14.4 m., max. pressure 27 3-4 lbs.=74 m. per hour, 3 A.M. Ozone 7.

10. Barometer reduced to sea level, max. 30.265, min. 29.98, mean 30.080.
Temperature, max. 25°, 20.5°, 1 A.M., min. 12.5°.11°, 11 A.M., mean hourly 15.9°.
Sun Thermometer, max. 23°. 10-30 A.M., bright sunshine 0.
Mean dew point 12.7°. mean force vapor .0892, mean humidity 87.7.
Wind, N., total movement 53 m., mean hourly vel. 2.2 m., max. pressure 3 1-3 lbs.=26 m. per hour, 12 M. Began snowing at 6 A.M. Ozone 1.

11. Barometer reduced to sea level, max. 30.46, min. 30.09, mean 30.292.
Temperature, max.30°, 28°, 12 P.M., min. 16.5°, 15°, 1 A.M., mean hourly 20.7°.
Sun Thermometer, max. 31°, 12 M., bright sunshine 0.
Mean dew point 22.3°, mean force vapor .1325, mean humidity 95.3.
Wind, N., total movement 116 m., mean hourly vel. 4.8 m., max. pressure 3-4 lbs.=12 m. per hour, 7.30 P.M. Snow, sleet and rain during the day. 2 1-2 in. snow fell. The total precipitation was .42 in. of water; at base of tower .60 in. Ozone 2.

12. Barometer reduced to sea level, max. 30.205. min. 30.09, mean 30.14.
Temperature, max. 49°, 49°, 4 P.M., min. 20°, 24°, 1 A.M., mean hourly 36.5°.
Sun Thermometer, max. 131°, 2 P.M., bright sunshine 9 1-2 hrs.
Mean dew point 34.5°, mean force vapor .2561, mean humidity 77.0.
Wind, E.S.E., total movement 26 m., mean hourly vel. 1.1 m., max. pressure 2 1-3 lbs.=21 m. per hour, 9 P.M. Began raining at 7 P.M. Ozone 0.

13. Barometer reduced to sea level, max. 30.20, min. 29.58, mean 29.845.
Temperature, max. 51°, 55°, 4 P.M., min. 27°, 24°, 7 A.M., mean hourly 40.7°.

Sun Thermometer, max. 62°, 4 P.M., bright sunshine 0.
Mean dew point 35.0°, mean force vapor .2842, mean humidity 76.0.
Wind. W.S.W., total movement 155 m., mean hourly vel. 6.5 m. max. pressure 14 lbs.=53 m. per hour, 7-30 P.M. Stopped raining at 1-30 P.M. .06 in water fell; at base of tower .07 in. Ozone 0.

14. Barometer reduced to sea level, max. 30.71, min. 30.105, mean 30.61.
Temperature. max. 32°, 38°, 1 A.M., min. 21.5°, 22°, 12 P.M., mean hourly 29.1°.
Sun Thermometer, max. 101°, 2 P.M., bright sunshine 9 1-2 hrs.
Mean dew point 10.7°, mean force vapor .1606, mean humidity 48.0.
Wind, S.S.W., total movement 175 m., mean hourly vel. 7.3 m., max. pressure 10 lbs.=45 m. per hour, 3 A.M. Ozone 2.

15. Barometer reduced to sea level. max. 30.71, min. 30.025, mean 30.275.
Temperature, max. 40°, 34°, 9 P.M., min. 25°, 22.5°, 1 A.M., mean hourly 29.0°.
Sun Thermometer. max. 35°, 2 P.M., bright sunshine 0.
Mean dew point 24°, mean force vapor .1910, mean humidity 68.3.
Wind, W., total movement 32 m., mean hourly vel. 1.3 m., max. pressure 3-4 lbs.=12 m. per hour, 6-30 P.M. Began raining at 9 A.M. Ozone 0.

16. Barometer reduced to sea level, max. 30.21, min. 29.60, mean 29.82.
Temperature, max. 48°, 46°, 11 A.M., min. 14°, 13°, 12 P.M., mean hourly 35.5°.
Sun Thermometer. max. 84°, 3 P. M., bright sunshine 1 hr.
Mean dew point 30°, mean force vapor .2267, mean humidity 78.7.
Wind, S.W., total movement 237 m., mean hourly vel. 9.9 m., max. pressure 16 lbs.=57 m. per hour, 3 P.M. Stopped raining at 3 P.M. 1.02 in. water fell. Snow squall in P. M.; fall of snow inappreciable. Ozone 0.

17. Barometer reduced to sea level, max. 30.575, min. 30.23, mean 30.543.
Temperature, max. 25°, 25°, 1 A.M., min. 13.5°, 12°, 8 A.M., mean hourly 20.0°.
Sun Thermometer, max. 82°, 12-30 P.M., bright sunshine 9 1-2 hrs.
Mean dew point 5.3°, mean force vapor .1098, mean humidity 54.7.
Wind, S.W., total movement 224 m., mean hourly vel. 9.3 m., max. pressure 10 lbs.=45 m. per hour, 2 A.M. Ozone 5.

18. Barometer reduced to sea level, max. 30.57, min. 30.435, mean 30.495.
Temperature, max. 37°,38.5°, 3 P.M., min. 19.5°,16.5°, 2 P.M., mean hourly 27.5°.
Sun Thermometer, max. 96°, 3 P.M., bright sunshine 4 hrs.
Mean dew point 21.7°, mean force vapor .1672, mean humidity 72.0.
Wind, W.N.W., total movement 59 m., mean hourly vel. 2.5 m., max. pressure 2-3 lbs.=12 m. per hour, 1 A.M. Ozone 0.

19. Barometer reduced to sea level, max. 30.48, min. 30.165, mean 30.353.
Temperature, max. 43°, 37°, 12 P.M., min. 19.5°, 16°, 7 A.M., mean hourly 30.4°.
Sun Thermometer, max. 85°, 11-30 A.M., bright sunshine 2 hrs.
Mean dew point 25.3°, mean force vapor .1891, mean humidity 75.0.
Wind, E.N.E., total movement 42 m., mean hourly vel. 1.8 m., max. pressure 2 lbs.=20 m. per hour, 12 P.M. Ozone 1.

20. Barometer reduced to sea level, max. 30.145, min. 29 61, mean 29.75.
Temperature, max. 55°, 54°, 5 P.M., min. 29.5°, 28°, 1 A.M., mean hourly 43.6°.
Sun Thermometer, max. 56°, 2 P.M., bright sunshine 0.
Mean dew point 37.3°, mean force vapor .3004, mean humidity 78.0.
Wind, E.S.E., total movement 248 m., mean hourly vel. 10.3 m., max. pressure 8 3-4 lbs.=42 m. per hour, 11-30 P.M. Rain from 6 A.M. to 6.30 P.M. .09 in. water fell; at base of tower, .11 in. Ozone 4.

21. Barometer reduced to sea level, max. 29 975, min. 29.865, mean 29.943.
Temperature, max. 37.5°,38.5°, 1 A.M., min. 16°, 14°, 10 P.M., mean hourly 34.4°.
Sun Thermometer, max. 101°, 1-30 P.M., bright sunshine 4 hrs.
Mean dew point 21.7°, mean force vapor .1883, mean humidity, 66.3.
Wind, S.W., total movement 226 m., mean hourly vel. 9.4 m., max. pressure 9 lbs=42 m. per hour, 1-30 A. M. Ozone 7.

22. Barometer reduced to sea level, max. 30.575, min. 29.94, mean 30.332.
Temperature, max. 20°, 28°, 1 A.M., min. 10°, 7°, 11 P. M., mean hourly 19.6°.
Sun Thermometer, max. 73°, 12 M., bright sunshine 6 hrs.
Mean dew point 5.7°, mean force vapor .0966, mean humidity 62.0.
Wind, S.W., total movement 337 m., mean hourly vel. 14.0 m., max. pressure 15 lbs.=55 m. per hour, 1 P.M. Ozone 0.

23. Barometer reduced to sea level, max. 30.60, min. 30.06, mean 30.35.
Temperature, max. 24.5°, 22.5°, 3 P.M., min. 11°, 8°, 5 A.M., mean hourly, 18.0°.
Sun Thermometer, max. 50°, 12 M., bright sunshine 0.
Mean dew point 12°, mean force vapor .1051, mean humidity 75.7.
Wind, E.S.E., total movement 92 m., mean hourly vel. 3.8 m., max. pressure 5 lbs.=32 m. per hour, 3 P.M. Light snow from 1.30 P.M. to 8-30 P.M. 1 3-4 in. snow fell=.045 in. water. Ozone 2.

24. Barometer reduced to sea level, max. 30.375, min. 30.04, mean 30.183°.
Temperature, max. 28°, 25°, 11 A.M., min. 10°, 4.5°, 12 P.M., mean hourly 23.1°.
Sun Thermometer, max. 92°, 11 A.M., bright sunshine 9 1-2 hrs.
Mean dew point 14.3°, mean force vapor .1286, mean humidity 69.0.
Wind, S.W., total movement 191 m., mean hourly vel. 8.0 m., max. pressure 7 lbs.=37 m. per hour, 3 P.M. Ozone 0.

25. Barometer reduced to sea level, max. 30.380, min. 29.855, mean 30.093.
Temperature, max. 40°, 38°, 12 P.M., min. 13°, 16.5°, 6 A.M., mean hourly 26.2°.
Sun Thermometer, max. 103°, 12 M., bright sunshine 7 1-2 hrs.
Mean dew point 18.7°, mean force vapor .1771, mean humidity 63.0.
Wind, E.S.E., total movement 137 m., mean hourly vel. 5.7 m., max. pressure 9 1-2 lbs.=44 m. per hour, 1 P. M. Ozone 0.

26. Barometer reduced to sea level, max. 29.87, min. 29.850, mean 29.858.
Temperature, max. 48.5°, 52°, 2 P.M., min. 32°, 31.5°, 3 A.M., mean hourly 40.8°.
Sun Thermometer, max. 130°, 1-30 P. M., bright sunshine 7 hrs.
Mean dew point 34.3°, mean force vapor .2757, mean humidity 72.3.
Wind, W., total movement 93 m., mean hourly vel. 3.9 m., max. pressure 1 3-4 lbs.=19 m. per hour, 6-30 P.M. Ozone 6.

27. Barometer reduced to sea level, max. 30.215, min. 29.775, mean 29.953.
Temperature, max. 36°, 36°, 1 A.M., min. 14°, 12.5°, 12 P.M., mean hourly 32.6°.
Sun Thermometer, max. 41°, 11 A.M., bright sunshine 0.
Mean dew point 30.7°, mean force vapor .2006, mean humidity 86.0.
Wind, W., total movement 120 m., mean hourly vel. 5 m., max. pressure 3 lbs. =24 m. per hour, 1-30 P.M. Began raining at 0 A.M. Stopped 10-30 A.M. .54 in. water fell; at base of tower .55 in. The rain was followed by sleet and snow. Ozone 3.

28. Barometer reduced to sea level, max. 30.63, min. 30.22, mean 30.613.
Temperature, max. 33°, 26°, 1 A.M., min. 13.5°, 12°, 7 A.M., mean hourly 19.1°.
Sun Thermometer, max. 83°, 3 P.M., bright sunshine 9 1-2 hrs.
Mean dew point 8.0°, mean force vapor .1061, mean humidity 62.3.
Wind, W.SW.., total movement 164 m., mean hourly vel. 6.8 m., max. pressure 4 lbs.=28 m. per hour, 5 A.M. Ozone 4.

29. Barometer reduced to sea level, max. 30.59, min. 30.17, mean 30.323.
Temperature, max. 51°, 49.5°, 4 P.M., min. 26°, 1 A.M., mean hourly 36.2°.
Sun Thermometer, max. 120°, 2 P.M., bright sunshine 7 1-4 hrs.
Mean dew point 22.3°, mean force vapor .2719, mean humidity 56.7.
Wind, E.S.E., total movement 146 m., mean hourly vel. 6.1 m., max. pressure 9 1-2 lbs.=44 m. per hour, 10 P.M. Ozone 0.

30. Barometer reduced to sea level, max. 30.46, min. 30.17, mean 30.277.
Temperature, max. 43°, 44.5°, 1 P.M., min. 26.5°, 25°, 12 P.M., mean hourly 34.8°.
Sun Thermometer, max. 61°, 10 A. M., bright sunshine 0.
Mean dew point 31.3°, mean force vapor .2022, mean humidity 87.7.
Wind, W., total movement 176 m., mean hourly vel. 7.5 m., max. pressure 4 1-2 lbs.=29 m. per hour, 2-30 P.M. Shower from 4.30 A.M. to 7 A.M. .04 in. water fell; at base of tower .08 in Ozone 4.

31. Barometer reduced to sea level, max. 30.46, min. 30.19, mean 30.298.
Temperature, max. 35°, 35°, 10 P.M., min. 27°, 25.5°, 1 A.M., mean hourly 31.3°
Sun Thermometer, max. 56°, 12 M., bright sunshine 0.
Mean dew point 31.0°, mean force vapor .1944, mean humidity 87.7.
Wind, E.S.E., total movement 102 m., mean hourly vel. 4.3 m., max. pressure 2 lbs=20 m. per hour, 4-30 P.M. Light rain from 1-30 A.M. to 9 A.M. .01 in. water fell; at base of tower .03 in. Ozone 7.

C. D. WARNER, Meteorologist.

BULLETIN No. 14. FEBRUARY, 1890

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.42; actual minimum reading 29.08; Mean reduced to sea level, 30.097; Monthly Range, 1.34.

Air Temperature. In Degrees Fahrenheit. Highest, at top of tower, 57.5°; at base of tower, 57.5°; Lowest, at top of tower, 7°; at base of tower, 3°; Mean, 31.7°; 32.0°; Monthly Range, 50.5°; Highest Mean Daily, 42.7°; Lowest Mean Daily, 11.9°; Mean Maximum, 40.7°; Mean Minimum, 21.6°; Mean Daily Range, 16°; Greatest Daily Range, 29°.

Humidity. Mean Dew Point, 25.2°; Mean Force of Vapor, .2017; Mean Relative Humidity, 74.8.

Wind. Prevailing Direction, N. W.; Total Movement, 4616 miles; Greatest Daily Movement, 340 m. 21st; Least Daily Movement, 18 m. 25th; Mean Daily Movement, 164.9 miles; Mean Hourly Velocity, 6.8 miles; Maximum Pressure per Square Foot 17 1-2 lbs.=59 m. per hour, 5th, at 3 P. M.

Precipitation. In inches. Total Precipitation, 3.55 in.; at base of tower 4.19 in.

Weather. Mean Cloudiness observed, 66 per cent; Number of Clear Days, 11; Number of Cloudy Days, 14; Number of Fair Days, 3; Total Cloudiness recorded by the Sun Thermometer, 175 hrs, or 57 per cent. Number of days on which .01 inches or more rain fell, 14. Depth of snow, in inches, on ground at close of month, 0.

Bright Sunshine. Number of Hours Recorded, 131.

Snow. 2nd, 8th, 10th, 17th, 20th, 23rd. Total fall, in inches, 5.

Mean Ozone, 3.4.

Halos, Lunar, 1st, 6th. Solar, 17th.

DAILY SUMMARY.

JAN. 1. Barometer reduced to sea level max. 30.61, min. 30.19, mean 30.43.
*Temperature, max. 39.5°, 38.5°, 11 A.M., min. 20°, 19°, 12 P.M., mean hourly 34.5°.
Sun Thermometer, max. 69°, 1 P.M., bright sunshine 1 hr.
Mean dew point 23.7°, mean force vapor .2051, mean humidity 63.0.
Wind, W., total movement, 203 m., mean hourly velocity 8.5. m., max. pressure, 5 lbs.= 32 m. per hour, 3 P.M. Ozone 5.

2. Barometer reduced to sea level, max. 30.695, min. 30.40, mean 30.565.
Temperature, max. 36°, 33.5°, 2 P.M., min. 20°, 19°, 7 A.M., mean hourly 27.9°.
Sun Thermometer. max. 50°, 12 M., bright sunshine 0.
Mean dew point 23.7°, mean force vapor .1728, mean humidity 78.7.
Wind, W., total movement 130 m., mean hourly vel. 5.4 m., max. pressure 2 lbs.=20 m. per hour, 1.30 A.M. Began snowing about 6 P. M.; turned into rain during the night. Ozone 4.

3. Barometer reduced to sea level, max. 30.39, min. 30.01, mean 30.09.
Temperature, max. 52°, 48.5°, 9 P.M., min. 30°, 27.5°, 1 A.M., mean hourly 37.0°.
Sun Thermometer, max. 75°, 2.30 P.M., bright sunshine 0.
Mean dew point 36.7°, mean force vapor .2671, mean humidity 84.3.
Wind, E.N.E., total movement 59 m., mean hourly vel. 2.5 m., max. pressure 9 1-2 lbs.=44 m. per hour, 8-30 P.M. Stopped raining about 12 M. .06 inches water fell; at base of tower, .07 inches. Ozone 5.

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*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to sea level, max. 30.290, min. 29.745, mean 30.110.
Temperature, max. 51°, 47.5°, 1 A.M., min. 34°, 31.5°, 7 P.M., mean hourly 37.5°.
Sun Thermometer, max. 116°, 12 M., bright sunshine 2 1-2 hrs.
Mean dew point 28.7°, mean force vapor .2358, mean humidity 68.7.
Wind, S.W., total movement 111 m., mean hourly vel. 4.6 m., max. pressure 3-4 lbs.=12 m. per hour, 12 P.M. Rain from 2 P.M. to 9 P.M. .41 inches water fell; at base of tower .42 inches. Ozone 2.

5. Barometer reduced to sea level, max. 29.93, min. 29.37, mean 29.638.
Temperature, max. 57.5°, 57.5°, 11 A.M., min. 34°, 31.5°, 12 P.M., mean hourly 42.7°
Sun Thermometer, max. 113°, 12 M., bright sunshine 2 hrs.
Mean dew point 34.7°, mean force vapor .3044, mean humidity 70.7.
Wind, S.W., total movement 335 m., mean hourly vel. 13.9 m., max. pressure 17 1-2 lbs.=59 m. per hour, 3 P. M. Ozone 4.

6. Barometer reduced to sea level, max. 30.505, min. 29.94, mean 30.250.
Temperature, max. 26°, 26.5°, 1 A.M., min 20°, 17°, 12 P.M., mean hourly 23.4°.
Sun Thermometer. max. 104°, 2 P.M., bright sunshine 10 hrs.
Mean dew point 14.0°, mean force vapor .1241, mean humidity 71.3.
Wind, W., total movement 192 m., mean hourly vel. 8.0 m., max. pressure 4 3-4 lbs.=31 m. per hour, 4-30 P. M. Ozone 4.

7. Barometer reduced to sea level, max. 30.72, min. 30.38, mean 30.640.
Temperature, max. 33°, 26.5°, 3 P.M., min. 7°, 6.5°, 6 A.M., mean hourly 20.0°.
Sun Thermometer, max. 93°, 12 M., bright sunshine 4 1-2 hrs.
Mean dew point 15.7°, mean force vapor .1187, mean humidity 82.3.
Wind, W.S.W., total movement 173 m., mean hourly vel. 7.2 m., max. pressure 4 lbs.=28 m. per hour, 5 P.M. Ozone 1.

8. Barometer reduced to sea level, max. 30.37, min. 29.57, mean 29.725.
Temperature, max. 52°, 52.5°, 1 P M., min. 26°, 23°, 1 A.M., mean hourly 33.6°.
Sun Thermometer, max. 53°, 11-30 A.M., bright sunshine 0.
Mean dew point 31.7°, mean force vapor .2085, mean humidity 86.3.
Wind, W., total movement 144 m., mean hourly vel. 6 0 m., max. pressure 11 lbs.=47 m. per hour, 9 P.M. 1-2 inch of snow fell during early morn. Snow changed to rain about 4-30 A. M. Stopped raining at 9 P. M. Total precipitation 1.31 inches water; at base of tower 1.53 inches. Ozone 8.

9. Barometer reduced to sea level, max. 30.54, min. 29.875, mean 30.30.
Temperature, max. 37.5°, 33.5°, 3 P.M., min. 24°, 22.5°, 12 P.M., mean hourly 28.5°
Sun Thermometer, max. 98°, 11 A.M., bright sunshine 10 hrs.
Mean dew point 20.3°, mean force vapor .1544, mean humidity 73.0.
Wind, E.N.E., total movement 240 m., mean hourly vel. .10 m., max. pressure 9 1-4 lbs.=43 m. per hour, 9 A.M. Ozone 5.

10. Barometer reduced to sea level, max. 30.675, min. 30.55, mean 30.632.
Temperature, max. 26°, 24.5°, 3 P.M., min. 11°, 12°, 5 A.M., mean hourly 20.9°.
Sun Thermometer, max. 60°, 12 M., bright sunshine 0.
Mean dew point 18.7°, mean force vapor .1222, mean humidity 87.7.
Wind, E.S.E., total movement 172 m., mean hourly vel. 7.2 m., max. pressure 1 1-3 lbs.=16 m. per hour. 8-30 A.M. Light snow from 8 A.M. to 5 P.M. 1-4 inch of snow fell. Ozone 3.

11. Barometer reduced to sea level, max. 30.63, min. 30.365, mean 30.528.
Temperature, max. 40°, 37°, 5 P.M., min. 22°, 20°, 1 A.M., mean hourly 28.9°.
Sun Thermometer, max. 112°, 2 P.M., bright sunshine 10 1-2 hrs.
Mean dew point 24.7°, mean force vapor .1773, mean humidity 77.7.
Wind, S.W., total movement 64 m., mean hourly vel. 2.7 m., max. pressure 3 1-4 lbs.=25 m. per hour, 9.30 P.M. Ozone 0.

12. Barometer reduced to sea level, max. 30.365, min. 29.99, mean 30.06.
Temperature, max. 46.5°, 45°, 12 M., min. 28.5°, 31°, 1 A.M., mean hourly 37.5°.
Sun Thermometer, max. 101°, 2-30 P.M., bright sunshine 1 1-2 hrs.
Mean dew point 27.7°, mean force vapor .2356, mean humidity 66.0.
Wind, S.W., total movement 256 m., mean hourly vel. 10.7 m., max. pressure 9 lbs.=42 m. per hour. 2 P.M. Ozone 7.

13. Barometer reduced to sea level, max. 30.21, min. 30.075, mean 30.153.
Temperature, max. 49°, 49°, 3 P.M., min. 29°, 26°, 7 A.M., mean hourly 38.3°.
Sun Thermometer, max. 130°, 2-30 P.M., bright sunshine 7 1-2 hrs.
Mean dew point 29.7°, mean force vapor .2515, mean humidity 68.0.
Wind, E.S.E., total movement 153 m., mean hourly vel. 6.4 m. max. pressure 1 3-4 lbs.=19 m. per hour, 11-30 P.M. Ozone 3.

14. Barometer reduced to sea level, max. 30.115, min. 29.40, mean 29.783.
Temperature, max. 54°, 52.5°, 7 P. M. min. 35°, 29°, 1 A.M. mean hourly 42.3°.
Sun Thermometer, max. 83°, 9-30 A.M., bright sunshine 0.
Mean dew point 40.3°, mean force vapor .3089, mean humidity 82.7.
Wind, W.S.W., total movement 213 m., mean hourly vel. 8.9 m., max. pressure 7 1-3 lbs.=38 m. per hour, 6.30 P. M. Shower from 4-30 P.M. to 7-30 P.M. .45 in. water fell; at base of tower .50 in. Ozone 2.

15. Barometer reduced to sea level, max. 30.07, min. 29.40, mean 29.770.
Temperature, max. 47°, 51°, 1 A.M., min. 29°, 26°. 12 P.M., mean hourly 39.5°.
Sun Thermometer, max. 110°, 11 A.M., bright sunshine 10 1-2 hrs.
Mean dew point 24.7°, mean force vapor .2145, mean humidity 64.0.
Wind, W.N.W., total movement 346 m., mean hourly vel. 14.4 m., max. pressure 16 lbs.=57 m. per hour, 7-15 P.M. Ozone 8.

16. Barometer reduced to sea level, max. 30.27, min. 30.08, mean 30.240.
Temperature, max. 36°, 38°, 3 P.M., min. 17°, 16°, 6 A.M., mean hourly 26.3°.
Sun Thermometer, max. 114°, 1-30 P.M., bright sunshine 10 1-2 hrs.
Mean dew point 13.3°, mean force vapor .1497, mean humidity 59.0.
Wind, W.N.W., total movement 281 m., mean hourly vel. 11.7 m., max. pressure 9 1-3 lbs.=43 m. per hour, 6 A.M. Ozone 3.

17. Barometer reduced to sea level, max. 30.20, min. 30.025, mean 30.115.
Temperature, max. 43°, 45°, 2 P.M., min. 30°, 26°, 1 A.M., mean hourly 36.7°.
Sun Thermometer, max. 78°, 1 P.M., bright sunshine 0.
Mean dew point 24.7°, mean force vapor .2416, mean humidity 66.3.
Wind, E.S.E., total movement 129 m., mean hourly vel. 5.4 m., max. pressure 2 1-4 lbs.=21 m. per hour, 7 P.M. Inappreciable quantity of snow fell during the afternoon. Ozone 0.

18. Barometer reduced to sea level, max. 30.025, min. 29.835, mean 29.852.
Temperature, max. 37°, 38.5°, 1 A.M., min. 27°, 23°, 7 A.M., mean hourly 30.5°.
Sun Thermometer, max. 32°, 1-30 P.M., bright sunshine 0.
Mean dew point 29.3°, mean force vapor .1820, mean humidity 90.0.
Wind, N., total movement 126 m., mean hourly vel. 5.3 m., max. pressure 3 lbs.=24 m. per hour, 1 P.M. Rain from 3 A. M. to 7 A.M. .19 in. water fell; at base of tower .21 in. Snow and sleet accompanied by lightning during the evening. Ozone 6.

19. Barometer reduced to sea level, max. 30.27, min. 29.85, mean 30.107.
Temperature, max. 30°, 32°, 5 A.M., min. 21°, 19°, 10 P.M., mean hourly 25.0°.
Sun Thermometer, max. 100°. 12 M., bright sunshine 8 1-2 hrs.
Mean dew point 16.3°, mean force vapor .1418, mean humidity 66.7.
Wind, W.N.W., total movement 166 m., mean hourly vel. 6.9 m., max. pressure 6 lbs.=35 m. per hour, 6 A.M. Ozone 6.

20. Barometer reduced to sea level, max. 30.23, min. 29.47, mean 29.655.
Temperature, max. 34°, 35.5°, 2 P.M., min. 18°, 19°, 12 P.M., mean hourly 24.8°.
Sun Thermometer, max. 138°, 2 P.M., bright sunshine 8 hrs.
Mean dew point 20.7°, mean force vapor .1550, mean humidity 76.0.
Wind, W.N.W., total movement 219 m., mean hourly vel. 9.1 m., max. pressure 14 3-4 lbs.=54 m. per hour, 12 P.M. Snow during morning. Four inches snow fell=.58 inches water.

21. Barometer reduced to sea level, max. 30.01, min. 29.77, mean 29.985.
Temperature, max. 24°, 25°, 1 A.M., min. 7°, 4.5°, 7 A.M., mean hourly 11.9°.
Sun Thermometer, max. 85°, 1 P.M., bright sunshine 11 hrs.
Mean dew point — 3°, mean force vapor .0727, mean humidity, 54.3.
Wind, W.N.W., total movement 340 m., mean hourly vel. 14.2 m., max. pressure 14 lbs=53 m. per hour, 7-30 A. M. Ozone 4.

22. Barometer reduced to sea level, max. 30.10, min. 29.42, mean 29.91.
Temperature, max. 25°, 25.5°, 5 P.M., min. 7°, 3°, 6 A. M., mean hourly 15.2°.
Sun Thermometer, max. 97°, 1 P.M., bright sunshine 11 hrs.
Mean dew point 4.3°, mean force vapor .0961, mean humidity 62.7.
Wind, W.N.W., total movement 157 m., mean hourly vel. 6.5 m., max. pressure 6 3-4 lbs.=37 m. per hour, 10 A.M. Ozone 0.

23. Barometer reduced to sea level, max. 30.065, min. 30.00, mean 30.073.
Temperature, max. 41°, 42°, 5 P.M., min. 12°, 5°, 7 A. M., mean hourly, 27.5°.
Sun Thermometer, max. 131°, 10-30 A.M., bright sunshine 11 hrs.
Mean dew point 17.7°, mean force vapor .1746, mean humidity 65.0.
Wind, S.S.E., total movement 101 m., mean hourly vel. 4.2 m., max. pressure 3 lbs.=24 m. per hour, 4 P.M. A very little snow fell during the evening. Ozone 0.

24. Barometer reduced to sea level, max. 30.05, min. 29.90, mean 29.792°.
Temperature, max. 43°, 42°, 12 M., min. 35°, 31°, 7 A.M., mean hourly 39.0°.
Sun Thermometer, max. 68°, 11-30 A.M., bright sunshine 0.
Mean dew point 37.7°, mean force vapor .2572, mean humidity 88.0.
Wind, S., total movement 60 m., mean hourly vel. 2.5 m., max. pressure 2 lbs.=20 m. per hour, 3 P.M. Rainy from 1-30 P.M. to 6 P.M. .02 in. water fell; at base of tower .04 in.

25. Barometer reduced to sea level, max. 30.095, min. 29.90, mean 29.992.
Temperature, max. 39°, 39.5°, 11 A.M., min. 36°, 33°, 6 A.M., mean hourly 37.8°.
Sun Thermometer, max. 50°, 11 A.M., bright sunshine 0.
Mean dew point 38.0°, mean force vapor .2403, mean humidity 94.7.
Wind, N.N.W., total movement 18 m., mean hourly vel. .8 m., max. pressure 0. Began to rain at 2 P.M.; rained more or less all day. Ozone 4.

26. Barometer reduced to sea level, max. 29.07, min. 29.82, mean 29.890.
Temperature, max. 57°, 62°, 3 P.M., min. 36°, 35°, 7 A.M., mean hourly 42.7°.
Sun Thermometer, max. 140°, 2 P. M., bright sunshine 11 hrs.
Mean dew point 37.0°, mean force vapor .3123, mean humidity 80.0.
Wind, N.N.W., total movement 120 m., mean hourly vel. 5 m., max. pressure 4 lbs.=28 m. per hour, 3 P.M. Stopped raining about 7 A. M. .47 in. water fell; at base of tower .52 in, Ozone 4.

27. Barometer reduced to sea level, max. 30.25, min. 30.07, mean 30.215.
Temperature, max. 43°, 44°, 3 P.M., min. 37°, 31°, 6 A.M., mean hourly 39.2°.
Sun Thermometer, max. 60°, 12 M., bright sunshine 0.
Mean dew point 36.7°, mean force vapor .2709, mean humidity 81.0.
Wind, E., total movement 70 m., mean hourly vel. 2.9 m., max. pressure 1 1-2 lbs.=17 m. per hour, 12 M. Ozone 6.

28. Barometer reduced to sea level, max. 30.25, min. 29.95, mean 30.055.
Temperature, max. 39°, 42°, 3 P.M., min. 37°, 34°, 8 P.M., mean hourly 37.9.°
Sun Thermometer, max. 40°, 3 P.M., bright sunshine 0.
Mean dew point 36.7°, mean force vapor .2534, mean humidity 85.7.
Wind, E., total movement 38 m., mean hourly vel. 1.6 m., max. pressure 1-2 lb. =10 m. per hour, 3 P.M. Began raining about 6 A.M. Rained more or less all day. Ozone 5.

C. D. WARNER, Meteorologist.

BULLETIN No. 15. MARCH, 1890

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.25; actual minimum reading 29.185; Mean reduced to sea level, 29.993; Monthly Range, 1.065.

Air Temperature. In Degrees Fahrenheit. Highest, at top of tower, 62°; at base of tower, 62.5°; Lowest, at top of tower, 2°; at base of tower, -6.5°; Mean, 31.9°; 31.0°; Monthly Range, 60°; Highest Mean Daily, 48.6°; Lowest Mean Daily, 13°; Mean Maximum, 38.7°; Mean Minimum, 25.2°; Mean Daily Range, 13.2°; Greatest Daily Range, 33°.

Humidity. Mean Dew Point, 26.5°; Mean Force of Vapor, .2007; Mean Relative Humidity, 77.3.

Wind. Prevailing Direction, N.; Total Movement, 5395 miles; Greatest Daily Movement 359 m. 2d; Least Daily Movement, 28 m. 15th; Mean Daily Movement, 174 miles; Mean Hourly Velocity, 7.3 miles; Maximum Pressure per Square Foot 13 1-2 lbs.=55 m. per hour. 2d, at 7 P. M.

Precipitation. In inches. Total Precipitation, 4.32 in.; at base of tower 5.37 in.

Weather. Mean Cloudiness observed, 66 per cent; Number of Clear Days, 9; Number of Cloudy Days, 16; Number of Fair Days, 6; Total Cloudiness recorded by the Sun Thermometer, 206 hrs, or 56 per cent. Number of days on which .01 inches or more rain fell, 17. Depth of snow, in inches, on ground at close of month, 1-2 in.

Bright Sunshine. Number of Hours Recorded, 160.

Snow. 1st, 2d, 3d, 5th, 6th, 14th, 15th, 19th, 22d, 23d, 25th, 28th, 29th, 31st. Total fall, in inches, 17.

Mean Ozone, 41 per cent.

Halos, Lunar, 4th, 5th, 24th, 29th.

Thunder Storm, 28th.

DAILY SUMMARY.

MAR. 1. Barometer reduced to sea level max. 29.89, min. 29.81, mean 29.848.
*Temperature. max. 38°, 39°, 1 A.M., min. 28°, 30°, 12 P.M., mean hourly 34.9°.
Sun Thermometer, max. 48°, 12 M., bright sunshine 0.
Mean dew point 28.3°, mean force vapor .2158, mean humidity 73.0.
Wind, N.W., total movement, 170 m., mean hourly velocity 7.1. m., max. pressure, 3 2-3 lbs.=27 m. per hour, 2-15 P.M. Stopped raining at 9 A.M. .08 in. water fell; at base of tower, .10 in. Trace of snow during night. Ozone 5.

2. Barometer reduced to sea level. max. 30.06, min. 29.89, mean 29.988.
Temperature, max. 31.5°, 32°, 1 A.M., min. 20°, 18°, 11 P.M., mean hourly 23.0°.
Sun Thermometer. max. 35°, 8 A.M., bright sunshine 0.
Mean dew point 13.3°, mean force vapor .1178, mean humidity 71.0.
Wind, N., total movement 359 m., mean hourly vel. 15 m., max. pressure 13 1-2 lbs.=52 m. per hour, 7 P.M. Ozone 1.

3. Barometer reduced to sea level, max. 30.19, min. 29.89, mean 30.028.
Temperature, max. 30°, 30.5°, 5 P.M., min. 16°, 13.5°, 6 A.M., mean hourly 22.0°.
Sun Thermometer, max. 106°, 2. P.M., bright sunshine 11 1-4 hrs.
Mean dew point 15.7°, mean force vapor .1243, mean humidity 75.3.
Wind, N.N.W., total movement 310 m., mean hourly vel. 12.9 m., max. pressure 7 1-4 lbs.=38 m. per hour, 7 A.M. 1 1-2 in. snow fell during early morn which when melted gave .11 in. water. Ozone 5.

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*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to sea level, max. 30.255, min. 30.07, mean 30.163.
Temperature, max. 34°, 36°, 3 P.M., min. 11.5°, 5°, 7 A.M., mean hourly 25.9°.
Sun Thermometer, max. 119°, 12.30 P. M., bright sunshine 11 1-4 hrs.
Mean dew point 20.3°, mean force vapor .1481, mean humidity 80.3.
Wind, S., total movement 115 m., mean hourly vel. 4.8 m., max. pressure 4 1-4 lbs.=29 m. per hour, 3 P.M. Ozone 0.

5. Barometer reduced to sea level, max. 30.22, min. 30.02, mean 30.112.
Temperature, max. 33°, 36°, 1 A.M., min. 24.5°, 21°, 10 P.M., mean hourly 30.6°.
Sun Thermometer, max. 118°, 12-30 P.M., bright sunshine 9 hrs.
Mean dew point 24.0°, mean force vapor .1776, mean humidity 75.0.
Wind, N.N.W., total movement 197 m., mean hourly vel. 8.2 m., max. pressure 2 lbs.=20 m. per hour, 12 M. Light snow during early morn. 1 1-2 in. snow fell=.10 in. water. Ozone 4.

6. Barometer reduced to sea level, max. 30.22, min. 30.05, mean 30.125.
Temperature, max. 25°. 25.5°, 1 A.M., min 11°, 12°, 12 P.M., mean hourly 18.9°.
Sun Thermometer, max. 28°, 4 P.M., bright sunshine 0.
Mean dew point 14.0°, mean force vapor .1026, mean humidity 84.3.
Wind, N.N.E., total movement 318 m., mean hourly vel. 13.3 m., max. pressure 13 lbs.=51 m. per hour, 11 A.M. Began to snow during night. Stopped about 5 P. M., 6 in. snow fell=.55 in. water. Ozone 6.

7. Barometer reduced to sea level, max. 30.30, min. 30.14, mean 30.265.
Temperature, max. 26°, 26.°. 5 P.M., min. 2°.—6.5°, 7 A.M., mean hourly 13.0°.
Sun Thermometer, max. 104°, 3 P.M., bright sunshine 11 1-4 hrs.
Mean dew point 5.3°, mean force vapor .0848, mean humidity 70.7.
Wind, N., total movement 153 m., mean hourly vel. 6.4 m., max. pressure 6 1-4 lbs.=35 m. per hour, 0 A.M. Ozone 7.

8. Barometer reduced to sea level, max. 30.36, min. 30.27, mean 30.318.
Temperature, max. 30°. 32°. 5 P.M., min. 5.5°.—2°, 7 A.M., mean hourly 18.6°.
Sun Thermometer, max. 118°, 1 P.M., bright sunshine 11 1-2 hrs.
Mean dew point 11.7°, mean force vapor .1131, mean humidity 75.3.
Wind, N.N.W., total movement 175 m., mean hourly vel. 7.3 m., max. pressure 8 lbs.=40 m. per hour, 3 P.M. Ozone 0.

9. Barometer reduced to sea level, max. 30.54, min. 30.36, mean 30.432.
Temperature, max. 35°, 36°. 5 P.M., min. 14°, 4°, 7 A.M., mean hourly 25.0°.
Sun Thermometer, max. 112°, 2 P.M., bright sunshine 11 1-2 hrs.
Mean dew point 15.3°, mean force vapor .1499, mean humidity 63.0.
Wind, N.N.W., total movement 159 m., mean hourly vel. 6.6 m., max. pressure 6 1-2 lbs.=36 m. per hour, 10 A.M. Ozone 1.

10. Barometer reduced to sea level, max. 30.56, min. 30.39, mean 30.472.
Temperature, max. 43°, 43°, 3 P.M., min. 10°, 0.5°, 7 A.M., mean hourly 27.7°.
Sun Thermometer, max. 133°. 12 M., bright sunshine 11 1-2 hrs.
Mean dew point 21.3°, mean force vapor .1925, mean humidity 73.0.
Wind, S., total movement 104 m., mean hourly vel. 4.3 m., max. pressure 3 lbs.=24 m. per hour, 3 P.M. Ozone 0.

11. Barometer reduced to sea level, max. 30.395, min. 30.20, mean 30.275.
Temperature, max. 39°, 40.5°. 11 A.M., min. 36°, 32.5°, 1 A.M., mean hourly 37.7°.
Sun Thermometer, max. 57°, 3 P.M., bright sunshine 0.
Mean dew point 38.0°, mean force vapor .2440, mean humidity 93.0.
Wind, S., total movement 114 m., mean hourly vel. 4.8 m., max. pressure 1 1-4 lbs.=16 m. per hour, 4.30 A.M. Light rain from 1 P.M. to 10 P.M. .04 in. water fell; at base of tower .08 in. Ozone 4.

12. Barometer reduced to sea level, max. 30.20, min. 30.10, mean 30.14.
Temperature, max. 62°, 62.5°, 5 P.M., min. 38°, 34.5°, 3 A.M., mean hourly 47.8°.
Sun Thermometer, max. 142°, 1 P.M., bright sunshine 5 hrs.
Mean dew point 49.0°, mean force vapor .4205, mean humidity 84.0.
Wind, S., total movement 63 m., mean hourly vel. 2.6 m., max. pressure 2-3 lbs.=11 m. per hour, 9.30 P.M. Ozone 2.

13. Barometer reduced to sea level, max. 30.22, min. 30.13, mean 30.157.
Temperature, max. 54°, 52°, 1 A.M., min. 44°, 40°, 11 P.M., mean hourly 48.6°.
Sun Thermometer, max. 73°, 12 M., bright sunshine 0.
Mean dew point 46.7°, mean force vapor .3771, mean humidity 84.7.
Wind, N.N.W., total movement 102 m., mean hourly vel. 4.3 m. max. pressure 1 lb.=14 m. per hour, 3-30 P.M. Ozone 3.

14. Barometer reduced to sea level, max. 30.225, min. 30.045, mean 30.120.
Temperature, max. 43°, 46°, 1 A.M. min. 33.5°, 32.5°, 2 P.M. mean hourly 36.6°.
Sun Thermometer, max. 36°, 1 P.M., bright sunshine 0.
Mean dew point 33.7°, mean force vapor .2173, mean humidity 91.3.
Wind, N.N.W., total movement 89 m., mean hourly vel. 3.7 m., max. pressure 3-4 lb.=12 m. per hour, 10.30 A.M. Began to rain at about 7 A.M. Rain and snow during the day. Ozone 4.

15. Barometer reduced to sea level, max. 30.045. min. 29.70. mean 29.820.
Temperature, max. 36°, 37°, 10 A.M., min. 30°, 30°, 12 P.M., mean hourly 33.6°.
Sun Thermometer, max. 59°. 3 P.M., bright sunshine 0.
Mean dew point 35.7°, mean force vapor .2085, mean humidity 88.0.
Wind, N., total movement 28 m., mean hourly vel. 1.2 m., max. pressure 1 lb. =14 m. per hour, 9 P.M. Snow ceased falling at about 8 P.M. 2 1-2 in. of snow fell. Total precipitation at top of tower .89 in.; at base 1.09 in. water. Ozone 5.

16. Barometer reduced to sea level, max. 29.70, min. 29.48, mean 29.553.
Temperature, max. 32°, 34.5°, 1 P.M., min. 21°, 17.5°, 12 P.M., mean hourly 27.°.
Sun Thermometer, max. 124°, 1 P.M., bright sunshine 10 hrs.
Mean dew point 21.3°, mean force vapor .1520, mean humidity 78.0.
Wind, N.W., total movement 158 m., mean hourly vel. 5.6 m., max. pressure 5 1-2 lbs.=33 m. per hour, 4.30 P.M. Ozone 6.

17. Barometer reduced to sea level, max. 29.56, min. 29.51, mean 29.530.
Temperature, max. 38°, 38.5°. 4 P.M., min. 18°, 14.5°, 2 A.M., mean hourly 28.8°.
Sun Thermometer, max. 102°, 11 A.M., bright sunshine 9 hrs.
Mean dew point 22.3°, mean force vapor .1653, mean humidity 76.3.
Wind, S.W., total movement 283 m., mean hourly vel. 11.8 m., max. pressure 8 lbs.=40 m. per hour. 1 P.M. A trace of snow fell in the evening. Ozone 1.

18. Barometer reduced to sea level, max. 29.805, min. 29.555, mean 29.648.
Temperature, max. 42.5°, 43°, 1 P.M., min. 31°, 24°, 6 A.M., mean hourly 36.3°.
Sun Thermometer, max. 100°, 9 P.M., bright sunshine 8 hrs.
Mean dew point 26.0°, mean force vapor .1515, mean humidity 66.7.
Wind, S.W., total movement 263 m., mean hourly vel. 10.9 m., max. pressure 11 lbs.=47 m. per hour, 3 P.M. A trace of snow in the forenoon. Ozone 7.

19. Barometer reduced to sea level, max. 29.89, min. 29.66, mean 29.770.
Temperature, max. 32°, 42°, 1 A.M., min. 22°, 14°, 12 P.M., mean hourly 26 8°.
Sun Thermometer, max. 40°, 12 M., bright sunshine 0.
Mean dew point 22.3°, mean force vapor .1539, mean humidity 80.0.
Wind, N.W., total movement 210 m., mean hourly vel. 8.8 m., max. pressure 4 3-4 lbs.=31 m. per hour, 6 P.M. Snow began to fall at about 8.30 A.M. and ceased at about 6 P.M. Snow=4 in.=.19 in. water. Ozone 8.

20. Barometer reduced to sea level, max. 30.08, min. 29.89, mean 30.022.
Temperature, max. 41°. 41°, 3 P.M., min. 20°. 18°, 2 A.M., mean hourly 31.7°.
Sun Thermometer, max. 133°, 11 A.M., bright sunshine 12 hrs.
Mean dew point 26.7°, mean force vapor .2016, mean humidity 74.7.
Wind, S.S.E., total movement 144 m., mean hourly vel. 6.0 m., max. pressure 5lbs.=32 m. per hour, 2 P.M. Ozone 9.

21. Barometer reduced to sea level, max. 29.955, min. 29.52, mean 29.663.
Temperature, max. 51°, 52°, 5 P.M., min. 36.5°, 34°, 1 A.M., mean hourly 43.0°.
Sun Thermometer, max. 88°, 3 P.M., bright sunshine 0.
Mean dew point 44.3°, mean force vapor .3235, mean humidity, 90.3.
Wind, S.W., total movement 163 m., mean hourly vel. 6.8 m., max. pressure 1 3-4 lbs=19 m. per hour, 2 A.M. Mist and rain began to fall during the night and ceased at about 4.30 P.M. At top of tower .10 in.; at base .14 in. water fell. Ozone 4.

22. Barometer reduced to sea level, max. 29.90, min. 29.68, mean 29.783.
Temperature, max. 43°, 44.5°, 12 M., min. 34°, 31.5°, 12 P.M., mean hourly 39.3°.
Sun Thermometer, max. 55°, 10-30 A.M., bright sunshine 0.
Mean dew point 37.7°, mean force vapor .2534, mean humidity 89.3.
Wind N., total movement 123 m., mean hourly vel. 5.1 m., max. pressure 2 1-2 lbs.=23 m. per hour, 4-30 P.M. Rain began to fall at about 10-30 A.M. turned into hail and snow during the night. Ozone 5.

23. Barometer reduced to sea level, max. 30.12, min. 29.67, mean 29.858.
Temperature, max. 38.5°,40.5°, 1 P.M., min. 29°,26°,10 P.M., mean hourly, 34.1°.
Sun Thermometer, max. 101°, 2 P.M., bright sunshine 1 hr.
Mean dew point 28.3°, mean force vapor .2011, mean humidity 78.3.
Wind, W.N.W., total movement 230 m., mean hourly vel. 9.6 m., max. pressure 8 1-2 lbs.=41 m. per hour, 4 P.M. Rain and snow fell during the forenoon. Storm ended at 2 P.M. 1.16 in. water fell; at base of tower 1.52 in. Ozone 6.

24. Barometer reduced to sea level, max. 30.53, min. 30.125, mean 30.455°.
Temperature, max. 40°, 40°, 5 P.M., min. 25°, 20°, 6 A.M., mean hourly 31.5°.
Sun Thermometer, max. 108°, 1-30 P.M., bright sunshine 12 1-4 hrs.
Mean dew point 18.3°, mean force vapor .1750, mean humidity 59.7.
Wind, W., total movement 207 m., mean hourly vel. 8.6 m., max. pressure 5 3-4 lbs.=34 m. per hour, 1 A.M. Ozone 5.

25. Barometer reduced to sea level, max. 30.54, min. 30.02, mean 30.313.
Temperature, max. 39.5°, 40°, 4 P.M., min. 29.5°, 25°, 5 A.M., mean hourly 34.7°.
Sun Thermometer, max. 59°, 9-15 A.M., bright sunshine 0.
Mean dew point 31.3°, mean force vapor .2165, mean humidity 83.3.
Wind, S.S.E., total movement 135 m., mean hourly vel. 5.6 m., max. pressure 5 1-4 lbs.=32 m. per hour, 4 P.M. Traces of snow fell in the forenoon. Rain began to fall at 6 P.M. Ozone 0.

26. Barometer reduced to sea level, max. 30.02, min. 29.60, mean 29.622.
Temperature, max. 52°, 57°, 12 M., min. 35.5°, 34°, 7 A.M., mean hourly 40.6°.
Sun Thermometer, max. 130°, 11 A.M., bright sunshine 3 hrs.
Mean dew point 35.3°, mean force vapor .2508, mean humidity 83.0.
Wind, W.N.W., total movement 153 m., mean hourly vel. 6.4 m., max. pressure 8 1-4 lbs.=40 m. per hour, 12 M. Rain stopped at about 7 A.M. .49 in. water fell; at base of tower .55 in. Ozone 3.

27. Barometer reduced to sea level, max. 29.975, min. 29.68, mean 29.860.
Temperature, max. 42°,44.5°, 4 P.M., min. 35°, 31.5°, 10 P.M., mean hourly 38.0°.
Sun Thermometer, max. 106°, 12 M., bright sunshine 6 hrs.
Mean dew point 26.0°, mean force vapor .2540, mean humidity 56.3.
Wind, W.N.W., total movement 293 m., mean hourly vel. 12.2 m., max. pressure 10 1-2 lbs.=46 m. per hour, 10.30 A.M. Ozone 6.

28. Barometer reduced to sea level, max. 29.975, min. 29.59, mean 29.690.
Temperature, max. 34°, 36.5°, 1 A.M., min. 31°, 28°, 5 A.M., mean hourly 32.1.°
Sun Thermometer, max. 36°, 11 A.M., bright sunshine 0.
Mean dew point 31.0°, mean force vapor .1897, mean humidity 93.3.
Wind, N., total movement 130 m., mean hourly vel. 5.4 m., max. pressure 3 1-2=27 m. per hour, 12 M. Began storming at about 3 A.M. 1 in. snow and sleet fell and was followed by rain accompanied by thunder and lightning at 6 P.M. Stopped raining at about 9 P.M. Ozone 6.

29. Barometer reduced to sea level, max. 29.81, min. 29.50, mean 29.623.
Temperature, max. 39°, 35°, 11 A.M., min. 30°, 28°, 11 P.M., mean hourly 33.6°.
Sun Thermometer, max. 80°, 10 A.M., bright sunshine 1 hr.
Mean dew point 28.3°, mean force vapor .2015, mean humidity 77.7.
Wind, N.W., total movement 157 m., mean hourly vel. 6.5 m., max. pressure 6 1-2 lbs.=36 m. per hour, 4 P.M. Began raining at about 2 A.M. and stopped at about 9 A.M., during the storm traces of snow fell. .61 in. water fell; at base of tower .89 in. Ozone 6.

30. Barometer reduced to sea level, max. 30.15, min. 29.81, mean 29.938.
Temperature, max. 40°, 40.5°, 4 P.M., min. 29°, 23°, 4 A.M., mean hourly 33.5°.
Sun Thermometer, max. 131°, 9 A.M., bright sunshine 8 hrs.
Mean dew point 22.0°, mean force vapor .3990, mean humidity 60.3.
Wind, W.S.W., total movement 198 m., mean hourly vel. 8.2 m., max. pressure 7 1-4 lbs.=38 m. per hour, 2 P.M. Ozone 6.

31. Barometer reduced to sea level, max. 30.365, min. 30.145, mean 30.308.
Temperature, max. 44°, 45°, 2 P.M., min. 28°, 22°, 5 A.M., mean hourly 35.7°
Sun Thermometer, max. 130°, 1-30 P.M., bright sunshine 7 hrs.
Mean dew point 29.0°, mean force vapor .2393, mean humidity 68.7.
Wind, S.W., total movement 92 m., mean hourly vel. 3.8 m., max. pressure 1 1-2 lbs=18 m. per hour, 7-30 P.M. Light snow, .5 in., from 10 P.M. to 12 P.M. .03 water fell; at base of tower .05 in. Ozone 3.

C. D. WARNER, Meteorologist.

BULLETIN No. 16. APRIL, 1890.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.275; actual minimum reading 29.215; Mean reduced to sea level, 30.098; Monthly Range, 1.06.

Air Temperature. In Degrees Fahrenheit. Highest, 75°; 79.5°; Lowest, 26.5°; 22°; Mean, 46.5°; 45.8°; Monthly Range, 48.5°, 57.5°; Highest Mean Daily, 61°, 61.5°; Lowest Mean Daily, 35.9°, 35.3°; Mean Maximum, 56.5°, 59.5°; Mean Minimum, 36.3°, 32.1°; Mean Daily Range, 20.2°, 26.9°; Greatest Daily Range, 38°; 48.5°.

Humidity. Mean Dew Point, 35.6°; Mean Force of Vapor, .3606; Mean Relative Humidity, 64.7.

Wind. Prevailing Directions, N. 14.4 per cent., N.N.E. 15.5 per cent., S.S.E. 14.4 per cent., N.W. 13.3 per cent., other directions 42.4 per cent.; Total Movement, 5020 miles; Greatest Daily Movement, 410 m. 5th; Least Daily Movement, 39 m. 14th; Mean Daily Movement, 167.3 miles; Mean Hourly Velocity, 6.96 miles; Maximum Pressure per Square Foot 11 1-2 lbs.=48 m. per hour, 17th, at 3 P. M.

Precipitation. In inches. Total Precipitation, 1.35 in.; at base of tower 1.73 in.

Weather. Mean Cloudiness observed, 50.4 per cent; Number of Clear Days, 17; Number of Cloudy Days, 6; Number of Fair Days, 7; Total Cloudiness recorded by the Sun Thermometer, 151 hrs, or 48 per cent. Number of days on which .01 inches or more rain fell, 9.

Bright Sunshine. Number of Hours Recorded, 245.

Snow, 8th. Total fall, in inches, a trace. Hail, a trace, 26th.

Mean Ozone, 35.3 per cent.

Halos, Solar, 21st; Lunar, 2d, 3d, 29th. Lunar coronae, 5th, 6th, 7th.

Frost, 8th, 12th, 16th, 19th, 20th, 21st, 26th, 29th.

DAILY SUMMARY.

APR. 1. Barometer reduced to sea level max. 30.48, min. 30.25, mean 30.323.
*Temperature, max. 43°, 42.5°, 5 P.M., min. 31°, 28°, 5 A.M., mean hourly 35.9°.
Sun Thermometer, max. 112°, 8 A.M., bright sunshine 7 1-2 hrs.
Mean dew point 28.3°, mean force vapor .2078, mean humidity 79.3.
Wind, N.W., total movement, 161 m., mean hourly velocity 6.7 m., max. pressure, 7 lbs.=37 m. per hour, 12-30 P.M. Ozone 3.

2. Barometer reduced to sea level, max. 30.575, min. 30.38, mean 30.48.
Temperature, max. 49°, 50.5°, 5 P.M., min. 27.5°, 22.5°, 5 A.M., mean hourly 38.4°.
Sun Thermometer, max. 123.5°, 9 A.M., bright sunshine 10 1-2 hrs.
Mean dew point 26.3°, mean force vapor .2511, mean humidity 58.7.
Wind, N.W., total movement 119 m., mean hourly vel. 4.9 m., max. pressure 4 1-2 lbs.=30 m. per hour, 3 P.M. Ozone 3.

3. Barometer reduced to sea level, max. 30.38, min. 30.075, mean 30.227.
Temperature, max. 67°, 70°, 4 P.M., min. 37°, 30°, 1 A.M., mean hourly 51.1°.
Sun Thermometer, max. 150°, bright sunshine 10 hrs.
Mean dew point 34.7°, mean force vapor .4726, mean humidity 50.3.
Wind, S.W., total movement 132 m., mean hourly vel. 5.5 m., max. pressure 2 1-2 lbs.=22 m. per hour, 3-30 P.M. Ozone 1.

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*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to sea level, max. 30.075, min. 29.525, mean 29.720.
Temperature, max. 53.5°, 55°, 1 P.M., min. 50°, 36°, 1 A.M., mean hourly 51.4°.
Sun Thermometer, max. 67°, bright sunshine 0.
Mean dew point 50.7°, mean force vapor .4884, mean humidity 76.0.
Wind, S., total movement 226 m., mean hourly vel. 9.4 m., max. pressure 3 1-4 lbs.=25 m. per hour, 1 P.M. Rain fell in showers between 6-30 A.M. and 8-30 P.M. Ozone 4.

5. Barometer reduced to sea level, max. 30.265, min. 29.54, mean 30.363.
Temperature, max. 45°, 54°, 3 P.M., min. 31°, 30°, 11 P.M., mean hourly 38.3°.
Sun Thermometer, max. 118°, bright sunshine 12 1-2 hrs.
Mean dew point 20.7°, mean force vapor .2268, mean humidity 55.7.
Wind, N.N.W., total movement 410 m., mean hourly vel. 17.1 m., max. pressure 10 1-4 lbs.=45 m. per hour, 4-30 A.M. A shower of rain fell between 1 A.M. and 2 A.M. .31 in. water fell during the 4th and 5th; at base of tower .41 in. Ozone 8.

6. Barometer reduced to sea level, max. 30.33, min. 30.055, mean 30.180.
Temperature, max. 58°, 61°, 5 P.M., min 30.5°, 30°, 6 A.M., mean hourly 44.2°.
Sun Thermometer, max. 140°, bright sunshine 13 hrs.
Mean dew point 31.0°, mean force vapor .3661, mean humidity 52.0.
Wind, S.W., total movement 140 m., mean hourly vel. 5.8 m., max. pressure 10 1-4 lbs.=45 m. per hour, 3 P.M. Ozone 3.

7. Barometer reduced to sea level, max. 30.055, min. 29.76, mean 29.850.
Temperature, max. 44°, 46.°, 0 A.M., min. 37°, 36.5°, 12 P.M., mean hourly 39.1°.
Sun Thermometer, max. 120° bright sunshine 0.
Mean dew point 39.3°, mean force vapor .2987, mean humidity 80.7.
Wind, N., total movement 131 m., mean hourly vel. 5.5 m., max. pressure 6 1-4 lbs.=35 m. per hour, 3-30 P.M. Rain began falling at about 5 A.M. and ceased at about 2 P.M. .25 in. water fell; at base of tower .28 in. Ozone 3.

8. Barometer reduced to sea level, max. 30.03, min. 29.98, mean 29.895.
Temperature, max. 54°, 57°, 1 P.M., min. 35°, 29.5°, 3 A.M., mean hourly 41.7°.
Sun Thermometer, max. 120°, bright sunshine 3 hrs.
Mean dew point 36.7°, mean force vapor .3212, mean humidity 71.0.
Wind, S.S.E., total movement 109 m., mean hourly vel. 4.5 m., max. pressure 6 lbs.=35 m. per hour, 3 P.M. Rain began to fall at about 4 P.M. and ceased falling at about 9 P.M. Traces of snow fell during the afternoon. Ozone 8.

9. Barometer reduced to sea level, max. 29.85, min. 29.50, mean 29.662.
Temperature, max. 41°, 44°, 12 M., min. 36.5°, 34.5°, 2 A.M., mean hourly 38.8°.
Sun Thermometer, max. 51°, bright sunshine 0.
Mean dew point 38.0°, mean force vapor .2482, mean humidity 92.0.
Wind, N.N.E., total movement 109 m., mean hourly vel. 4.5 m., max. pressure 3 lbs.=24 m. per hour, 6.15 P.M. Shower at 5 A.M. Rain began falling at about 1 P.M. and ceased at about 8 P.M. .42 in. water fell; at base of tower .54 in. Ozone 5.

10. Barometer reduced to sea level, max. 29.70, min. 29.50, mean 29.603.
Temperature, max. 48°, 49°, 12 M., min. 38°, 36.5°, 12 P.M., mean hourly 43.1°.
Sun Thermometer, max. 120°, bright sunshine 3 hrs.
Mean dew point 31.3°, mean force vapor .2753, mean humidity 62.3.
Wind, N.W., total movement 208 m., mean hourly vel. 8.7 m., max. pressure 10 1-4 lbs.=45 m. per hour, 10 A.M. Ozone 6.

11. Barometer reduced to sea level, max. 30.155, min. 29.70, mean 29.968.
Temperature, max. 47°, 50.5°, 3 P.M., min. 32°, 30.5°, 12 P.M., mean hourly 40.3°.
Sun Thermometer, max. 119°, 3 P.M., bright sunshine 8 hrs.
Mean dew point 28.3°, mean force vapor .2479, mean humidity 62.0.
Wind, N.W., total movement 215 m., mean hourly vel. 8.9 m., max. pressure 7 lbs.=37 m. per hour, 11 A.M. Ozone 1.

12. Barometer reduced to sea level, max. 30.35, min. 30.155, mean 30.223.
Temperature, max. 63°, 63.5°, 4 P.M., min. 27.5°, 23°, 4 A.M., mean hourly 45.5°.
Sun Thermometer, max. 138°, 1-30 P.M., bright sunshine 13 hrs.
Mean dew point 36.0°, mean force vapor .3436, mean humidity 66.3.
Wind, S.W., total movement 63 m., mean hourly vel. 2.6 m., max. pressure 1 3-4 lbs.=18 m. per hour, 4 P.M. Ozone 1.

13. Barometer reduced to sea level, max. 30.21, min. 29.95, mean 30.030.
Temperature, max. 75°, 79.5°, 3 P.M., min. 37°, 31°, 5 A.M., mean hourly 61.0.°
Sun Thermometer, max. 152°, 11-30 A.M., bright sunshine 12 hrs.
Mean dew point 47.0°, mean force vapor .5758, mean humidity 66.0.
Wind, E.S.E., total movement 87 m., mean hourly vel. 3.6 m. max. pressure 3 lbs.=24 m. per hour, 3-30 P.M. Ozone 1.

14. Barometer reduced to sea level, max. 29.985, min. 29.81, mean 29.887.
Temperature, max. 74°, 77°, 4 P.M. min. 46.5°, 40°, 6 A.M. mean hourly 60.2°.
Sun Thermometer, max. 158°, 11 A.M., bright sunshine 12 hrs.
Mean dew point 48.0°, mean force vapor .5953, mean humidity 61.0.
Wind, S.W., total movement 39 m., mean hourly vel. 1.6 m., max. pressure 3 1-2 lb.=26 m. per hour, 10 P.M. Ozone 1.

15. Barometer reduced to sea level, max. 30.355, min. 29.90, mean 30.220.
Temperature, max. 51°, 61°, 1 P.M., min. 36°, 34.5°, 12 P.M., mean hourly 45.5°.
Sun Thermometer, max. 121°, 2 P.M., bright sunshine 11 hrs.
Mean dew point 26.0°, mean force vapor .2975, mean humidity 48.3.
Wind, N.N.W., total movement 361 m., mean hourly vel. 15.0 m., max. pressure 11 lbs.=47 m. per hour, 3 P.M. Ozone 3.

16. Barometer reduced to sea level, max. 30.43, min. 30.215, mean 30.315.
Temperature, max. 56°, 58°, 4 P.M., min. 28°, 22°, 5 A.M., mean hourly 45.0°.
Sun Thermometer, max. 142°, 11 A.M., bright sunshine 13 1-4 hrs.
Mean dew point 27.0°, mean force vapor .3193, mean humidity 49.7.
Wind, W.N.W., total movement 99 m., mean hourly vel. 4.1 m., max. pressure 6 1-2 lbs.=36 m. per hour, 1 P.M. Ozone 0.

17. Barometer reduced to sea level, max. 30.23, min. 29.86, mean 29.972.
Temperature, max. 61°, 62.5°, 3 P.M., min. 39°, 34°, 4 A.M., mean hourly 50.4°.
Sun Thermometer, max. 124°, 12 M., bright sunshine 12 hrs.
Mean dew point 35.0°, mean force vapor .3813, mean humidity 59.3.
Wind, N.W., total movement 216 m., mean hourly vel. 9.0 m., max. pressure 11 1-2 lbs.=48 m. per hour, 3 P.M. Ozone 1.

18. Barometer reduced to sea level, max. 30.01, min. 29.79, mean 29.893.
Temperature, max. 48°, 49.5°, 3 P.M., min. 30°, 29°, 12 P.M., mean hourly 39.5°.
Sun Thermometer, max. 121°, 10 A.M., bright sunshine 13 1-4 hrs.
Mean dew point 21.0°, mean force vapor .2340, mean humidity 51.7.
Wind, N.N.E., total movement 255 m., mean hourly vel. 10.6 m., max. pressure 8 1-2 lbs.=41 m. per hour, 6 P.M. Ozone 5.

19. Barometer reduced to sea level, max. 30.31, min. 30.01, mean 30.177.
Temperature, max. 52°, 53.5°, 4 P.M., min. 26.5°, 22.5°, 4 A.M., mean hourly 35.6°.
Sun Thermometer, max. 96°, 2-30 P.M., bright sunshine 12 hrs.
Mean dew point 27.7°, mean force vapor .2508, mean humidity 65.3.
Wind, N., total movement 273 m., mean hourly vel. 11.4 m., max. pressure 6 3-4 lbs.=37 m. per hour, 4-30 P.M. Ozone 4.

20. Barometer reduced to sea level, max. 30.375, min. 30.31, mean 30.347.
Temperature, max. 57°, 59°, 3 P.M., min. 31°, 24.5°, 5 A.M., mean hourly 45.9°.
Sun Thermometer, max. 107°, 1-30 P.M., bright sunshine 13 1-2 hrs.
Mean dew point 27.0°, mean force vapor .3216, mean humidity 51.0.
Wind, N., total movement 123 m., mean hourly vel. 5.1 m., max. pressure 8 1-4 lbs.=41 m. per hour, 3 P.M. Ozone 3.

21. Barometer reduced to sea level, max. 30.375, min. 30.225, mean 30.303.
Temperature, max. 63°, 66°, 2 P.M., min. 34°, 27°, 5 A.M., mean hourly 50.9°.
Sun Thermometer, max. 118°, 12 M., bright sunshine 7 1-2 hrs.
Mean dew point 35.3°, mean force vapor .4388, mean humidity, 50.3.
Wind, N.N.W., total movement 152 m., mean hourly vel. 6.3 m., max. pressure 8 1-4 lbs=41 m. per hour, 6 P.M. Ozone 1.

22. Barometer reduced to sea level, max. 30.435, min. 30.33, mean 30.365.
Temperature, max. 66°, 67.5°, 4 P.M., min. 41°, 31.5°, 6 A.M., mean hourly 53.0°.
Sun Thermometer, max. 125°, 10 A.M., bright sunshine 12 hrs.
Mean dew point 39.7°, mean force vapor .4334, mean humidity 62.3.
Wind S.W., total movement 105 m., mean hourly vel. 4.4 m., max. pressure 4 lbs.=28 m. per hour, 4-30 P.M. Ozone 1.

23. Barometer reduced to sea level, max. 30.37, min. 30.12, mean 30.222.
Temperature, max. 67°, 70.5°, 1 P.M., min. 41°, 35.5°, 5 A.M., mean hourly, 54.9°.
Sun Thermometer, max. 103°, 10 A.M., bright sunshine 0.
Mean dew point 45.0°, mean force vapor .4942, mean humidity 66.3.
Wind, S.S.W., total movement 193 m., mean hourly vel. 8.0 m., max. pressure 5 1-4 lbs.=32 m. per hour, 1-30 P.M. A trace of rain fell at about 5 P.M. Ozone 1.

24. Barometer reduced to sea level, max. 30.165, min. 30.10, mean 30.127°.
Temperature, max. 68°, 71.5°, 12 M., min. 52.5°, 51.5°, 12 P.M., mean hourly 59.8°.
Sun Thermometer, max. 121°, 11-30 A.M., bright sunshine 0.
Mean dew point 52.3°, mean force vapor .5544, mean humidity 73.3.
Wind, S.E., total movement 160 m., mean hourly vel. 6.7 m., max. pressure 2 1-2 lbs.=22 m. per hour, 7 P.M. Light showers in latter part of afternoon and evening. Ozone 4.

25. Barometer reduced to sea level, max. 30.345, min. 30.17, mean 30.258.
Temperature, max. 59°, 60°, 4 P.M., min. 42°, 39.5°, 7 A.M., mean hourly 47.9°.
Sun Thermometer, max. 110°, 3 P.M., bright sunshine 4 1-2 hrs.
Mean dew point 32.3°, mean force vapor .3271, mean humidity 60.7.
Wind, N., total movement 165 m., mean hourly vel. 6.9 m., max. pressure 6 1-2 lbs.=36 m. per hour, 11 A.M. Light showers in the early part of the day. Rain ceased falling at about 9 A.M. .04 in. water fell during the 24th and 25th; at base of tower .06 in. Ozone 6.

26. Barometer reduced to sea level, max. 30.475, min. 30.26, mean 30.41.
Temperature, max. 53°, 56.5°, 1 P.M., min. 36°, 30°, 5 A.M., mean hourly 44.6°.
Sun Thermometer, max. 105°, 9 A.M., bright sunshine 4 hrs.
Mean dew point 32.7°, mean force vapor .3115, mean humidity 65.0.
Wind, S.E., total movement 162 m., mean hourly vel. 6.8 m., max. pressure 2 3-4 lbs.=23 m. per hour, 4 P.M. Rain began to fall at about 5 P.M. and continued to fall at intervals during the evening. At 6 P.M. a trace of hail fell. Ozone 5.

27. Barometer reduced to sea level, max. 30.26, min. 29.855, mean 29.937.
Temperature, max. 43.5°, 46°, 5 P.M., min. 38°, 35.5°, 2 A.M., mean hourly 40.8°.
Sun Thermometer, max. 26°, 2 P.M., bright sunshine 0.
Mean dew point 41.7°, mean force vapor .2774, mean humidity 94.7.
Wind, N., total movement 54 m., mean hourly vel. 2.3 m., max. pressure 1 1-4 lbs.=16 m. per hour, 2 A.M. Rain fell at intervals all day and ceased at about 11-30 P.M. Ozone 6.

28. Barometer reduced to sea level, max. 30.15, min. 29.875, mean 30.072.
Temperature, max. 61°, 62.5°, 4 P.M., min. 42°, 38.5°, 5 A.M., mean hourly 49.5°.
Sun Thermometer, max. 117°, 12-30 P.M., bright sunshine 12 hrs.
Mean dew point 38.7°, mean force vapor .3759, mean humidity 66.0.
Wind, N.N.E., total movement 181 m., mean hourly vel. 7.5 m., max. pressure 8 lbs.=40 m. per hour, 8-30 A.M. A trace of rain fell about 3 A.M. .33 in. water fell during the 26th, 27th and 28th; at base of tower, .44 in. Ozone 7.

29. Barometer reduced to sea level, max. 30.15, min. 29.945, mean 30.040.
Temperature, max. 61°, 63.5°, 2 P.M., min. 35°, 29°, 5 A.M., mean hourly 49.1°.
Sun Thermometer, max. 106°, 1 P.M., bright sunshine 13 hrs.
Mean dew point 40.7°, mean force vapor .3927, mean humidity 68.7.
Wind, S.W., total movement 134 m., mean hourly vel. 5.6 m., max. pressure 6 1-2 lbs.=36 m. per hour, 5 P.M. A trace of rain fell at about 10 P.M. Ozone 5.

30. Barometer reduced to sea level, max. 29.97, min. 29.78, mean 29.847.
Temperature, max. 67°, 69.5°, 3 P.M., min. 41.5°, 39.5°, 5 A.M., mean hourly 54.2°.
Sun Thermometer, max. 117°, 12-30 P.M., bright sunshine 12 hrs.
Mean dew point 48.7°, mean force vapor .4900, mean humidity 73.7.
Wind, S., total movement 238 m., mean hourly vel. 9.9 m., max. pressure 4 3-4 lbs.=31 m. per hour, 12 M. Ozone 6.

C. D. WARNER, Meteorologist.

BULLETIN No. 17. MAY, 1890.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.035; actual minimum reading 29.235; Mean reduced to sea level, 29.959; Monthly Range, .80.

****Air Temperature.*** In Degrees Fahrenheit. Highest, 77°; 80°; Lowest, 37.5°; 31.5°; Mean, 57°; 56.3°; Monthly Range, 48.5°, 39.5°; Highest Mean Daily, 64.9°, 66.5°; Lowest Mean Daily, 48.9°, 48.5°; Mean Maximum, 66.9°, 68.8°; Mean Minimum, 47.1°, 43.8°; Mean Daily Range, 19.9°, 24.9°; Greatest Daily Range, 31.5°; 36.5°.

Humidity. Mean Dew Point, 58°; Mean Force of Vapor, .5335; Mean Relative Humidity, 67.1.

Wind. Prevailing Directions, N. 15 per cent., S. 19 per cent., S.S.W. 23 per cent., N.W. 8 per cent., other directions 35 per cent.; Total Movement, 5284 miles; Greatest Daily Movement, 330 m. 20th; Least Daily Movement, 84 m. 24th; Mean Daily Movement, 170 miles; Mean Hourly Velocity, 7.1 miles; Maximum Pressure per Square Foot, 16 1-2 lbs.=58 m. per hour, 20th, at 10-30 A. M.

Precipitation. In inches. Total Precipitation, 4.56 in.; at base of tower 5.39 in.

Weather. Mean Cloudiness observed, 59 per cent; Number of Clear Days, 10; Number of Cloudy Days, 12; Number of Fair Days, 9; Total Cloudiness recorded by the Sun Thermometer, 235 hrs, or 51 per cent. Number of days on which .01 inches or more rain fell, 14.

Bright Sunshine. Number of Hours Recorded, 225.

Mean Ozone, 39 per cent., aurora 15th.

Frost, 12th. ***Lunar Corona,*** 31st. ***Thunder and Lightning,*** 14th and 28th.

DAILY SUMMARY.

May 1. Barometer reduced to sea level, max. 29.985, min. 29.72, mean 29.80.
*Temperature, max. 72°, 75°, 12 M., min. 45.5°, 45.5°, 12 P.M, mean hourly 56.6°
Sun Thermometer, max. 119°, 10-30 A.M., bright sunshine 6 hrs.
Mean dew point 48.7°, mean force vapor .5036, mean humidity 74.
Wind, N., total movement, 193 m., mean hourly velocity 8 m., max. pressure. 7 3-4 lbs.=39 m. per hour, 11 A.M. Rain began falling at about 4 P. M., and ceased at about 7 P.M. .06 inch water fell; at base of tower, .09 in. Ozone 40.

2. Barometer reduced to sea level, max. 30.21, min. 29.985, mean 30.163.
Temperature, max. 62°, 64°, 4P.M., min. 37.5°, 33°, 5 A.M., mean hourly 48.9°
Sun Thermometer, max. 119°, 1-30P.M., bright sunshine 13 3-4 hrs.
Mean dew point 39.3°, mean force vapor .4117, mean humidity 62.
Wind, N.E., total movement 149m., mean hourly vel. 6.2 m., max. pressure 7 1-4 lbs.= 38 m. per hour, 1-30 A.M. Ozone 60.

3. Barometer reduced to sea level, max. 30.19, min. 29.995, mean 30.09.
Temperature, max. 66°, 68°, 4 P.M., min. 42°, 38.5°. 2A.M., mean hourly 53.9°.
Sun Thermometer, max. 106°, 2 P.M., bright sunshine 10 hrs.
Mean dew point 46.3°, mean force vapor .4557, mean humidity 72.
Wind, S. S.W., total movement 267 m., mean hourly vel. 11.1 m., max. pressure 7 1-4 lbs.= 38 m. per hour, 12 M. A trace of rain fell in the latter part of the evening. Ozone 40.

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*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to sea level, max. 30.03, min. 29.79, mean 29.927.
Temperature, max. 64°, 66°, 6 P.M., min. 51°, 48.5°, 1 A.M., mean hourly 57.8°.
Sun Thermometer, max. 65°, 11 A.M., bright sunshine 0.
Mean dew point 57.3°, mean force vapor .5714, mean humidity 82.7.
Wind, S. S.E., total movement 129 m., mean hourly vel. 5.4 m., max. pressure 2 1-4 lbs.= 21 m. per hour, 6 P.M. Showers during the day. Rain began falling heavily at about 10 P.M. Ozone 20.

5. Barometer reduced to sea level, max. 29.79, min. 29.62, mean 29.627.
Temperature, max. 70°, 73°, 4 P.M., min. 60°, 56°, 1 A.M., mean hourly 63.2°.
Sun Thermometer, max. 103°, 2 P.M.,bright sunshine 2 hrs.
Mean dew point 62°, mean force vapor .6581, mean humidity 85.
Wind, S., total movement 156 m., mean hourly vel. 6.5 m., max. pressure 2 3-4 lbs.=23 m. per hour, 4 P.M. Rain ceased falling at about 12 M. .81 in. water fell during the 3, 4 and 5; at base of tower, .91 in. Ozone 40.

6. Barometer reduced to sea level, max. 29.715, min. 29.62, mean 29.632.
Temperatnre, max. 60°, 65°, 8 A.M., min 50°, 51°, 12 P.M., mean hourly 57.1°.
Sun Thermometer, max. 47°, 12 M., bright sunshine 0.
Mean dew point 56°, mean force vapor .5171, mean humidity 87.7.
Wind, S. S.W., total movement 118 m., mean hourly vel. 4.9 m., max. pressure 1 3-4 lbs.=19 m. per hour, 10-30 A.M. Rain began falling at about 8-30 A. M. and ceased at about 8 P. M. .76 in. of water fell; at base of tower .83 in. Ozone 10.

7. Barometer reduced to sea level, max. 30.01, min. 29.715, mean 29.962.
Temperature, max. 62°, 63.5°, 3 P.M., min. 43°, 38°, 5 A.M., mean hourly 53°.
Sun Thermometer, max. 118°, 1 P. M., bright sunshine 10 hrs.
Mean dew point 40.7°, mean force vapor .4446, mean humidity 59.3.
Wind, N., total movement 89 m., mean hourly vel. 3.7 m., max. pressure 1 1-2 lbs.=17 m. per hour, 1 A.M. Ozone 60.

8. Barometer reduced to sea level, max. 30.045, min. 30.01, mean 30.023.
Temperature, max. 52°, 55.5.°, 10 A M., min. 46°, 42°, 12 P.M., mean hourly 49.4°
Sun Thermometer, max. 73°, 8-30 A.M., bright sunshine 1 hr.
Mean dew point 35.7°, mean force vapor .3526, mean humidity 59.3.
Wind, N., total movement 255 m., mean hourly vel. 10.6 m., max. pressure 8 lbs.=40 m. per hour, 11-30 A.M. A trace of rain fell at 3 P. M. Ozone 40.

9. Barometer reduced to sea level, max. 30.11, min. 29.975, mean 30.05.
Temperature, max. 65°, 67°, 3 P.M., min. 41°, 34.5°, 4 A.M., mean hourly 54.3°.
Sun Thermometer, max. 114°, 11-30 A.M., bright sunshine 12 hrs.
Mean dew point 42.7°. mean force vapor .4351, mean humidity 67.
Wind, S.W., total movement 157 m.. mean hourly vel. 6.5 m., max. pressure 7 lbs.=37 m. per hour, 5-30 P.M. Ozone 30.

10. Barometer reduced to sea level, max. 29.98, min. 29.87, mean 29.898.
Temperature, max. 65°, 67°. 1 P.M., min. 49°, 50.5°, 12 P.M., mean hourly 58.1°.
Sun Thermometer, max. 93°, 12 M., bright sunshine 0.
Mean dew point 56.3°, mean force vapor .5813, mean humidity 79.7.
Wind, S.W., total movement 227 m., mean hourly vel. 9.5 m., max. pressure 4 1-4 lbs.=29 m. per hour, 4 A.M. Rain fell, in showers during the day, beginning at about 12-30 A.M. Ozone 40.

11. Barometer reduced to sea level, max. 30.19, min. 29.885, mean 30.105.
Temperature, max. 65°, 66°, 4 P.M., min. 44.5°, 43.5°, 6 A.M., mean hourly 52.8°.
Sun Thermometer, max. 105°, 1 P.M., bright sunshine 14 1-4 hrs.
Mean dew point 38°, mean force vapor .3996, mean humidity 63.3.
Wind, N. N.E,, total movement 288 m., mean hourly vel. 12 m., max. pressure 8 lbs.=40 m. per hour, 11 A.M. Rain ceased falling at about 6-30 A.M. The rainfall for the 10th and 11th was .31 in.; at base of tower .42 in. Ozone 60.

12. Barometer reduced to sea level, max. 30.205, min. 29.95, mean 30.67.
Temperature, max. 69°, 68°, 4 P.M., min. 37.5°, 31.5°, 4 A.M., mean hourly 54.7°.
Sun Thermometer, max. 122°, 10.30 A.M., bright sunshine 14 1-4 hrs.
Mean dew point 43°. mean force vapor .4693, mean humidity 62.
Wind, S., total movement 104 m., mean hourly vel. 4.3 m., max. pressure 2 3-4 lbs.=23 m. per hour, 10-30 A M. Ozone 40.

13. Barometer reduced to sea level, max. 29.97, min. 29.72, mean 29.827.
Temperature, max. 68.5°, 68°, 4 P.M., min. 47°, 44.5°, 4 A.M., mean hourly 56.9°.
Sun Thermometer, max. 116°, 1 P.M., bright sunshine 10 1-2 hrs.

Mean dew point 51.3°, mean force vapor .5482, mean humidity 73.
Wind, S.W., total movement 304 m., mean hourly vel. 12.7 m., max. pressure 10 3-4 lbs.=46 m. per hour, 2-30 P.M. Mist fell during the evening. Ozone 40.

14. Barometer reduced to sea level, max. 29.745, min. 29.695, mean 29.718.
Temperature, max. 77°, 80°, 3 P.M., min. 55.5°, 53.5°, 1 A.M., mean hourly 64.6°.
Sun Thermometer, max. 133°, 2 P.M., bright sunshine 14 1-4 hrs.
Mean dew point 60.7°, mean force vapor .7240, mean humidity 79.
Wind, S., total movement 204 m., mean hourly vel. 8.5 m., max. pressure 5 1-4 lbs.=32 m. per hour, 6 P.M. Showers fell during the day beginning at about 1-30 A.M. and ending at about 8 P.M. Thunder and lightning at 6 P.M. The amount of rainfall was .44 in.; at base of tower .54 in. Ozone 30.

15. Barometer reduced to sea level, max. 29.85, min. 29.695, mean 29.785.
Temperature, max. 65°, 65°, 6 P.M., min. 57.5°, 56°, 11 A.M., mean hourly 60.7°
Sun Thermometer, max. 70°, 12 M., bright sunshine 0.
Mean dew point 60.3°, mean force vapor .5884, mean humidity 88.7.
Wind, S. S.W., total movement 85 m., mean hourly vel. 3.5 m., max. pressure 3-4 lbs.=12 m. per hour, 12-30 A.M. A gentle rain fell between 8 A.M. and 3 P.M., .16 in. water fell; at base of tower .19 in. Ozone 20.

16. Barometer reduced to sea level, max. 29.92, min. 29.85, mean 29.875.
Temperature, max. 74°, 75.5°, 1 P.M., min. 46°, 44°, 12 P.M., mean hourly 58.8°.
Sun Thermometer, max. 132°, 11 A.M., bright sunshine 9 hrs.
Mean dew point 53.3°. mean force vapor .6029, mean humidity 72.3.
Wind, N. N.W., total movement 122 m., mean hourly vel. 5 m., max. pressure 7 1-2 lbs.=39 m. per hour, 2-30 P.M. A heavy shower fell between 4 P.M. and 5 P.M., .015 in. water fell; at base of tower .035 in. Ozone 40.

17. Barometer reduced to sea level, max. 29.95, min. 29.80, mean 29.88.
Temperature, max. 64°, 66°, 2 P.M., min. 39°. 33°, 4 A.M., mean hourly 52.8°.
Sun Thermometer, max. 113°, 11 A.M., bright sunshine 8 hrs.
Mean dew point 41.7°, mean force vapor .4404, mean humidity 65.7.
Wind, S.W., total movement 128 m., mean hourly vel. 5.3 m., max. pressure 6 1-4 lbs.=35 m. per hour, 11 A.M. A shower of rain fell between 4-30 P.M. and 5-30 P.M., .025 in. water fell; at base of tower .03 in. Ozone 50.

18. Barometer reduced to sea level, max. 30.10, min. 29.955, mean 30.087.
Temperature, max. 66°, 67°, 4 P.M., min. 43.5°, 37°, 4 A.M., mean hourly 55°.
Sun Thermometer, max. 123°, 11-30 A.M., bright sunshine 13 hrs.
Mean dew point 40.7°, mean force vapor .4789, mean humidity 54.7.
Wind, S., total movement 153 m., mean hourly vel. 6.4 m., max. pressure 4 1-2 lbs.=30 m. per hour, 5 P.M. Ozone 60.

19. Barometer reduced to sea level, max. 30.085, min. 29.855, mean 29.933.
Temperature, max. 73°, 77°, 3 P.M., min. 51°, 48.5°. 4 A.M., mean hourly 61.3°.
Sun Thermometer, max. 124°, 2 P.M., bright sunshine 3 hrs.
Mean dew point 58.7°, mean force vapor .6865, mean humidity 75.
Wind, S. S.W., total movement 173 m., mean hourly vel. 7.2 m., max. pressure 5 1-2 lbs.=33 m. per hour, 4 P.M. A fine mist fell between 6 A.M, and 9 A.M. Only a trace of water fell. Ozone 40.

20. Barometer reduced to sea level, max. 29.86, min. 29.515, mean 29.687.
Temperature, max. 67°, 70°, 10 A.M., min. 49°, 47.5°, 12 P.M., mean hourly 60.6°.
Sun Thermometer, max. 78°, 12 M., bright sunshine 0.
Mean dew point 55.7°, mean force vapor .5486, mean humidity 83.7.
Wind, S., total movement 330 m., mean hourly vel. 13.8 m., max. pressure 16 1-2 lbs.=58 m. per hour, 10-30 P.M. Showers fell between 9-30 A.M. and 4-30 P.M., .27 in. water fell; at base of tower .52 in. Ozone 40.

21. Barometer reduced to sea level, max. 30.245, min. 29.83, mean 30.18.
Temperature, max. 69°, 69°, 6 P.M., min. 44°, 39°. 4 A.M., mean hourly 55.1°.
Sun Thermometer, max. 126°, 2-30 P.M., bright sunshine 14 1-2 hrs.
Mean dew point 40.7°, mean force vapor .4449, mean humidity 59.7.
Wind, N. N.W., total movement 177 m., mean hourly vel. 7.4 m., max. pressure 4 3-4 lbs.=31 m. per hour, 1 A.M. Ozone 60.

22. Barometer reduced to sea level, max. 30.325, min. 30.245, mean 30.312.
Temperature, max. 64°, 66°, 4 P.M., min. 45°, 40.5°, 5 A.M., mean hourly 54.1°.
Sun Thermometer, max. 118°, 2 P.M., bright sunshine 6 hrs.
Mean dew point 41.3°, mean force vapor .4664, mean humidity 58.7.

Wind, N. E., total movement 191 m., mean hourly vel. 8 m., max. pressure 10 3-4 lbs.=46 m. per hour, 4-30 P.M. Ozone 90.

23. Barometer reduced to sea level, max. 30.325, min. 30.04, mean 30.143.
Temperature, max. 68°, 68°, 2 P.M., min. 40°, 35.5°, 5 A.M., mean hourly 54.8°.
Sun Thermometer, max. 131°, 10-30 A.M., bright sunshine 8 hrs.
Mean dew point 46°, mean force vapor .5448, mean humidity 61.
Wind, S.W., total movement 113 m., mean hourly vel. 4.7 m, max. pressure 3-4 lbs.=12 m. per hour, 1 P.M. Ozone 40.

24. Barometer reducedt o sea level, max. 30.175, min. 30.035, mean 30.048.
Temperature, max. 77°, 78°, 3 P.M., min. 54.5°, 51°, 5 A.M., mean hourly 64.9°
Sun Thermometer, max. 139°, 11 A.M., bright sunshine 11 hrs.
Mean dew point 52.7°, mean force vapor .6911, mean humidity 61.7.
Wind, S. S.E., total movement,84 m., mean hourly vel. 3.5 m., max pressure 2 1-2 lbs.=22 m. per hour, 7 P.M. Ozone 10.

25. Barometer reduced to sea level, max. 30.225, min. 30.18, mean 30.198.
Temperature, max. 70.5°, 73°, 3 P.M., min. 53.5°, 49°, 12 P.M., mean hourly 61.7°
Sun Thermometer, max. 129°, 9 A.M., bright sunshine 9 hrs.
Mean dew point 56°, mean force vapor .6432, mean humidity 72.
Wind, S., total movement 197 m., mean hourly vel. 8.2 m., max. pressure 4 1-4 lbs.=29 m. per hour, 10-30 A.M. A trace of rain fell at about 3 P.M. Ozone 20.

26. Barometer reduced to sea level, max. 30.225, min. 29.95, mean 30.182,
Temperature, max. 56.5°, 57°, 6 P.M., min. 50°, 47°, 4 A.M., mean hourly 53.6°.
Sun Thermometer, max. 46°, 2 P.M., bright sunshine 0.
Mean dew point 52.3°, mean force vapor .5325, mean humidity 73.3.
Wind, S., total movement 141 m., mean hourly vel. 5.9 m., max. pressure 3-4 lbs.=12 m. per hour, 2 P.M. Rain began falling at about 9-30 A.M. and continued through the day. Ozone 40.

27. Barometer reduced to sea level, max. 29.95, min. 29.805, mean 29.935.
Temperature, max. 65°, 69°, 2 P.M., min. 51°, 52.5°, 12 P.M., mean hourly 57.9°.
Sun Thermometer, max. 82°, 1 P.M., bright sunshine 2 hrs.
Mean dew point 57.3°, mean force vapor .5686, mean humidity 84.
Wind, N. N.E., total movement 139 m., mean hourly vel. 5.8 m., max. pressure 7 lbs.=37 m. per hour, 5 P.M. Rain ceased falling at about 12 M., 1.86 in. water fell during the 26 and 27; at base of tower 2 in. Ozone 50.

28. Barometer reduced to sea level, max. 29.87, min. 29.79, mean 29.86.
Temperature, max. 65°, 67°, 5 P.M., min. 47°, 42.5°, 3 A.M., mean hourly 57.8°.
Sun Thermometer, max. 112°, 12 M., bright sunshine 6 hrs.
Mean dew point 51°, mean force vapor .4822, mean humidity 77.7.
Wind, N., total movement 201 m., mean hourly vel. 8.4 m., max. pressure 10 1-2 lbs.=46 m. per hour, 6 P.M. Rain fell in very light showers between 12-30 P.M. and 8-30 P.M., distant thunder at 4 P. M., .00 3-4 in. water fell; at base of tower .01 in. Ozone 30.

29. Barometer reduced to sea level, max. 29.985, min. 29.87, mean 29.963.
Temperature, max. 65°, 68.5°, 2 P.M., min. 48°, 42°, 4 A.M., mean hourly 58.2°.
Sun Thermometer, max. 121°, 12-30 P.M., bright sunshine 13 hrs.
Mean dew point 46°, mean force vapor .5116, mean humidity 62.3.
Wind, N. N.E., total movement 197 m., mean hourly vel. 8.2 m., max. pressure 9 1-4 lbs.=43 m. per hour, 12-30 P.M. Ozone 40.

30. Barometer reduced to sea level, max. 29.995, min. 29.89, mean 29.953.
Temperature, max. 72.5°, 72°, 4 P.M., min. 45°, 39.5°, 4 A.M., mean hourly 59.3°.
Sun Thermometer, max. 131°, 1 P. M., bright sunshine 12 hrs.
Mean dew point 51.7°, mean force vapor .5902, mean humidity 68.7.
Wind, N., total movement 89 m., mean hourly vel. 3.7 m., max. pressure 7 3-4 lbs=39 m. per hour, 11 A.M. A trace of rain fell between 6 P.M. and 7 P.M. Ozone 10.

31. Barometer reduced to sea level, max. 29.90, min. 29.735, mean 29.813.
Temperature, max. 76°, 78°, 3 P.M., min. 46°, 42°, 4 A.M., mean hourly 62.5°
Sun Thermometer, max. 136°, 10-30 A.M., bright sunshine 12 hrs.
Mean dew point 48°, mean force vapor .6440, mean humidity 56.3.
Wind, N.W., total movement 132 m., mean hourly vel. 5.5 m., max. pressure 10 1-2 lbs.=46 m. per hour, 4-30 P.M. Ozone 20.

C. D. WARNER, Meteorologist.

BULLETIN No. 18. JUNE, 1890.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.000; actual minimum reading 29.425; Mean reduced to sea level, 29.975; Monthly Range, .575 in.

****Air Temperature.*** In Degrees Fahrenheit. Highest, 86°; 88°; Lowest, 43.0°; 40.5°; Mean, 66.5°; 65.3°; Monthly Range, 43.°, 47.5°; Highest Mean Daily, 75.9°, 76.5°; Lowest Mean Daily, 51.9°, 52.0°; Mean Maximum, 75.7°, 77.6°; Mean Minimum, 55.6°, 52.9°; Mean Daily Range, 20.1°, 24.7°; Greatest Daily Range, 33.5°; 39.5°. Least Daily Range, 8.5°; 10.5°.

Humidity. Mean Dew Point, 57.9°; Mean Force of Vapor, .7184; Mean Relative Humidity, 71 3.

Wind. Prevailing Directions, N. 17 per cent., S. 12 per cent., S.S.W. 11 per cent.t S. E. 10 per cent., other directions 50 per cent.; Total Movement, 3776 miles; Greates, Daily Movement, 209 m., 9th; Least Daily Movement, 29 m. 15th; Mean Daily Movement 125.9 miles; Mean Hourly Velocity, 5.2 miles; Maximum Pressure per Square Foot, 10 lbs.=45 m. per hour, 27th, at 9-30 A. M.

Precipitation. In inches. Total Precipitation, 1.42 in.; at base of tower 1.53 in.

Weather. Mean Cloudiness observed, 49.9 per cent; Number of Clear Days, 15; Number of Cloudy Days, 8; Number of Fair Days, 7; Total Cloudiness recorded by the Sun Thermometer, 184 hrs., or 41.0 per cent. Number of days on which .01 inches or more rain fell, 8.

Bright Sunshine. Number of Hours Recorded, 264.

Mean Ozone, 22.8 per cent.

Halos, Solar, 10th. ***Lunar Coronæ,*** 1st, 27th.

Thunder and Lightning, 4th, 5th, 6th, 11th, 18th, 24th. ***Rainbows,*** 19th, 22nd.

DAILY SUMMARY.

June 1. Barometer reduced to sea level, max. 29.88, min. 29.78, mean 29.852.
*Temperature, max. 79°, 80°, 6 P.M., min. 48°, 41°,5 A.M., mean hourly 65.9°.
Sun Thermometer, max. 138°, 10 A.M., bright sunshine 14 3-4 hrs.
Mean dew point 49°, mean force vapor .7055, mean humidity 52.
Wind, N.W., total movement, 114 m., mean hourly velocity 4.7 m., max. pressure, 3 3-4 lbs.=27 m. per hour, 10-30 A.M. Ozone 10.

2. Barometer reduced to sea level, max. 30.075, min. 29.88, mean 29.977.
Temperature, max 73°,75.5°, 3 P.M.,min. 50.5°,45.5°, 12 P.M., mean hourly 62.8°
Sun Thermometer, max. 118°, 10 A.M., bright sunshine 13 hrs.
Mean dew point 44°, mean force vapor .6257, mean humidity 48.
Wind, N.W., total movement 171 m., mean hourly vel. 7.1 m., max. pressure 7 1-2 lbs.= 39 m. per hour, 5 P.M. Ozone 10.

3. Barometer reduced to sea level, max. 30.17, min. 30.08, mean 30.132.
Temperature, max. 74°, 75.5°, 2 P.M., min. 43°, 46.5°, 4 A.M., mean hourly 60°.
Sun Thermometer, max. 134°, 10-30 A.M., bright sunshine 11 hrs.
Mean dew point 49.3°, mean force vapor .6286, mean humidity 58.
Wind, S., total movement 94 m., mean hourly vel. 3.9 m., max. pressure 3 lbs.=24 m. per hour, 4-30 P.M. Light showers of rain fell between 5 P. M. and 7 P.M. Only a trace of water fell. Ozone 30.

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*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to sea level, max. 30.105, min. 29.96, mean 29.987.
Temperature, max. 73.5°, 76°, 5 P.M., min. 53°, 51.5°, 4 A.M., mean hourly 62.2°.
Sun Thermometer, max. 109°, 3-30 P.M., bright sunshine 1 hr.
Mean dew point 62°, mean force vapor .6755, mean humidity 83.7.
Wind, S. S.W., total movement 69 m., mean hourly vel. 2.9 m., max. pressure 1-2 lb.= 10 m. per hour, 10 A.M. Rain fell in showers between 2 A.M. and 8 A.M. .16 in. water fell at both base and top of tower. Ozone 10.

5. Barometer reduced to sea level, max. 29.995, min. 29.96, mean 29.967.
Temperature, max. 82°, 81.5°, 3 P.M., min. 59°, 57.5°, 4 A.M., mean hourly 68.9°.
Sun Thermometer, max. 142°, 10 A.M., bright sunshine 14 hrs.
Mean dew point 62.3°, mean force vapor .7852, mean humidity 75.7.
Wind, S.E., total movement 131 m., mean hourly vel. 5.4 m., max. pressure 4 lbs.=28 m. per hour, 7-30 P.M. Showers of rain fell between 4 A.M. and 11 P.M. .84 in water fell at both base and top of tower. Ozone 20.

6. Barometer reduced to sea level, max. 29.995, min. 29.915, mean 29.957.
Temperature, max. 68°, 68.5°, 1 P.M., min 59°, 58°, 12 P.M., mean hourly 63.9°.
Sun Thermometer, max. 98°, 8 30 A M., bright sunshine 0.
Mean dew point 62.3°, mean force vapor .6719, mean humidity 85.7.
Wind, S.E., total movement 171 m., mean hourly vel. 7.1 m., max. pressure 2 lbs.=20 m. per hour, 9 A.M. Mist fell between 9 A.M. and 10 A.M. Rain began falling at about 6 P.M. and ceased falling at about 7-30 P.M. .11 in. water fell; at base of tower .13 in. Ozone 40.

7. Barometer reduced to sea level, max. 29.915, min. 29.805, mean 29.852.
Temperature, max. 77°, 78.5°, 3 P.M., min. 57.5°, 58.5°, 4 A.M., mean hourly 65°.
Sun Thermometer, max. 134°, 11-30 A. M., bright sunshine 7 hrs.
Mean dew point 64.3°, mean force vapor .7066. mean humidity 88.3.
Wind, N. N.W., total movement 154 m., mean hourly vel. 6.4 m., max. pressure 3 1-2 lbs.=24 m. per hour, 7 P.M. A trace of rain fell at 4.30 P.M. Ozone 20.

8. Barometer reduced to sea level, max. 30.24, min. 39.875, mean 30.20.
Temperature, max. 68.5°, 69.5.°, 4 P.M., min. 52°, 48°, 5 A.M., mean hourly 60.1°
Sun Thermometer, max. 116°, 12-30 P.M., bright sunshine 15 hrs.
Mean dew point 42.3°, mean force vapor .5327, mean humidity 52.
Wind. N.W., total movement 205 m., mean hourly vel. 8.5 m., max. pressure 4 1-2 lbs.=30 m. per hour, 7-30 A.M. Ozone 40.

9. Barometer reduced to sea level, max. 30.24. min. 30.155, mean 30.198.
Temperature, max. 76°, 79°, 1 P.M., min. 54°, 48°, 5 A.M., mean hourly 65.5°.
Sun Thermometer, max. 121°, 1 P.M., bright sunshine 12 hrs.
Mean dew point 50°, mean force vapor .6852, mean humidity 55.7
Wind, N.W., total movement 209 m., mean hourly vel. 8.7 m., max. pressure 6 1-2 lbs.=36 m. per hour, 10-30 A.M. Ozone 30.

10. Barometer reduced to sea level, max. 30.265, min. 30.11, mean 30.182.
Temperature, max. 80.5°, 80°, 5 P.M., min. 47°, 40.5°, 4 A.M., mean hourly 65.7°.
Sun Thermometer, max. 128°, 11 A.M., bright sunshine 15 hrs.
Mean dew point 57°, mean force vapor .7203, mean humidity 66.3.
Wind, S., total movement 50 m., mean hourly vel. 2.1 m., max. pressure 1 3-4 lbs.=19 m. per hour, 1-30 P.M. Ozone 40.

11. Barometer reduced to sea level, max. 30.11, min. 29.87, mean 29.943.
Temperature, max. 82°, 85°, 1 P.M., min. 62°, 59°, 3 A.M., mean hourly 72.1°.
Sun Thermometer, max. 141°, 10 A.M.; bright sunshine 8 hrs.
Mean dew point 63.3°, mean force vapor .9111, mean humidity 65.7.
Wind, S.W., total movement 144 m., mean hourly vel. 6 m., max. pressure 1 3-4 lbs.=19 m. per hour, 1-30 P.M. A trace of rain fell at 8 P.M. Ozone 10.

12. Barometer reduced to sea level, max. 29.975, min. 29.87, mean 29.932.
Temperature, max. 65°, 71°, 1 A.M., min. 48°, 48°, 11 P.M., mean hourly 54.8°.
Sun Thermometer, max. 38°, 11 A.M., bright sunshine 0.
Mean dew point 52.3°, mean force vapor .4208, mean humidity 94.3.
Wind, N.E., total movement 138 m., mean hourly vel. 5.8 m., max. pressure 2 3-4 lbs.=23 m. per hour, 10 P. M. A trace of rain fell during the night. Rain began to fall at about 10-30 A. M. and ceased at about 11-30 P.M. Ozone 40.

13. Barometer reduced to sea level, max. 29.975, min. 29.94, mean 29.952.
Temperature, max. 56.5°, 58°, 5 P.M., min. 47.5°, 46°, 5 A.M., mean hourly 51.9°
Sun Thermometer, max. 49°, 3 P.M., bright sunshine 0.
Mean dew point 51.3°, mean force vapor .4254, mean humidity 89.3.
Wind, N., total movement 163 m., mean hourly vel. 6.8 m., max. pressure 1 1-4 lbs.=16 m. per hour, 12 M. Rain began to fall at about 4-30 A.M., and ended at about 7-30 A.M. .24 in. water fell on the 12th and 13th; at base of tower .31 in. Ozone 70.

14. Barometer reduced to sea level, max. 29.945, min. 29.915, mean 29.932.
Temperature, max. 68°, 67.5°, 3 P.M., min. 53°, 51°, 1 A.M., mean hourly 60.2°.
Sun Thermometer, max. 108°, 11-30 A.M., bright sunshine 0.
Mean dew point 59.3°, mean force vapor .6021, mean humidity 86.7.
Wind, S.W., total movement 32 m., mean hourly vel. 1.3 m., max. pressure 1-2 lb.=10 m. per hour, 5.30 P.M. A shower of rain fell between 4 P.M. and 5 P.M. Ozone 40.

15. Barometer reduced to sea level, max. 30.185, min. 29.93, mean 30.072.
Temperature, max. 72°, 77.5°, 5 P.M., min. 58°, 57.5°, 5 A.M., mean hourly 62.5°
Sun Thermometer, max. 121°, 2-30 P.M., bright sunshine 2 hrs.
Mean dew point 61.7°, mean force vapor .6313, mean humidity 89.7.
Wind, S. S.E., total movement 29 m., mean hourly vel. 1.2 m., max. pressure 3-4 lbs.=12 m. per hour, 1 A.M. A shower of rain fell between 5 A.M. and 6 A.M. .05 in. water fell on the 14th and 15; at base of tower .06 in. Ozone 10.

16. Barometer reduced to sea level, max. 30.28, min. 30.185, mean 30.247.
Temperature, max. 74°, 76.5°, 2 P.M., min. 58°, 54°, 12 P.M., mean hourly 64.9°.
Sun Thermometer, max. 137°, 9 A.M., bright sunshine 8 hrs.
Mean dew point 59°, mean force vapor .6926, mean humidity 73.7.
Wind, S. S.W., total movement 92 m., mean hourly vel. 3.8 m., max. pressure 1 3-4 lbs.=19 m. per hour, 4 P.M. Ozone 10.

17. Barometer reduced to sea level, max. 30.225, min. 29.95, mean 30.068.
Temperature, max. 76°, 78.5°, 3 P.M., min. 58°, 56°, 1 A.M., mean hourly 66.1°.
Sun Thermometer, max. 126°, 10 A.M., bright sunshine 12 hrs.
Mean dew point 64°, mean force vapor .7499, mean humidity 80.7.
Wind, S., total movement 157 m., mean hourly vel. 6.5 m., max. pressure 2 3-4 lbs.=23 m. per hour, 3-30 P.M. Ozone 20.

18. Barometer reduced to sea level, max. 29.95, min. 29.80, mean 29.853.
Temperature, max. 83°, 85°, 3 P.M., min. 61°, 59.5°, 2 A.M., mean hourly 71.6°.
Sun Thermometer, max. 134°, 12 M., bright sunshine 12 hrs.
Mean dew point 66°, mean force vapor .8655, mean humidity 75.3.
Wind, S.S. W., total movement 171 m., mean hourly vel. 7.1 m., max. pressure 4 1-4 lbs.=29 m. per hour, 2-30 P.M. Ozone 10.

19. Barometer reduced to sea level, max. 30.04, min. 29.82, mean 29.887.
Temperature, max. 76°, 78.5°, 2 P.M., min. 56.5°, 51.5°, 12 P.M., mean hourly 66°.
Sun Thermometer, max. 135°, 10-30 A.M., bright sunshine 7 hrs.
Mean dew point 56.3°, mean force vapor .7478, mean humidity 63.
Wind, N. N.E., total movement 104 m., mean hourly vel. 4.3 m., max. pressure 6 1-2 lbs.=36 m. per hour, 2-30 P.M. A heavy shower of rain fell at about 4 P. M., lasting only a few minutes. .015 in water fell; at base of tower .03 in. Ozone 5.

20. Barometer reduced to sea level, max. 30.16, min. 30.01, mean 30.135.
Temperature, max. 76°, 74°, 5 P.M., min. 51°, 45°, 4 A.M., mean hourly 63°.
Sun Thermometer, max. 134°, 12 M., bright sunshine 13 hrs.
Mean dew point 52.3°, mean force vapor .6191, mean humidity 67.
Wind, N., total movement 93 m., mean hourly vel. 3.9 m., max. pressure 2 1-2 lbs.=22 m. per hour, 10-30 A.M. Ozone 30.

21. Barometer reduced to sea level, max. 30.145, min. 29.945, mean 30.055.
Temperature, max. 69°, 68.5°, 12 M., min. 56.5°, 55.5°, 12 P.M., mean hourly 62.5°.
Sun Thermometer, max. 78°, 7-30 A.M., bright sunshine 1 hr.
Mean dew point 59°, mean force vapor .6290, mean humidity 79.3.

Wind, S.W., total movement 154 m., mean hourly vel. 6.4 m., max. pressure 4 1-2 lbs.=30 m. per hour, 2-30 P.M. A few drops of rain fell several times during the day. Only a trace of water fell. Ozone 10.

22. Barometer reduced to sea level, max. 30.02, min. 29.915, mean 29.947.
Temperature, max. 79°, 80.5°, 3 P.M., min. 55°, 54°, 5 A.M., mean hourly 66.7°.
Sun Thermometer, max. 143°, 11-30 A.M., bright sunshine 11 hrs.
Mean dew point 60.7°, mean force vapor .7630, mean humidity 72.
Wind, E.S.E., total movement 108 m., mean hourly vel. 4.5 m., max. pressure 1 1-2 lbs.=17 m. per hour, 1-30 P.M. Ozone 60.

23. Barometer reduced to sea level, max. 30.08, min. 30.025, mean 30.058.
Temperature, max. 71.5°, 72.5°, 3 P.M., min. 57°, 53.5°, 5 A.M., mean hourly 65.3°.
Sun Thermometer, max. 104°, 3 P.M., bright sunshine 3 hrs.
Mean dew point 66°, mean force vapor .7492, mean humidity 87.
Wind, S., total movement 88 m., mean hourly vel. 3.7 m, max. pressure 1 lb.=14 m. per hour, 1 P.M. Ozone 10.

24. Barometer reduced to sea level, max. 30.05, min. 29.83, mean 29.957.
Temperature, max. 84°, 88°, 4 P.M., min. 63°, 61.5°, 3 A.M., mean hourly 72.1°
Sun Thermometer, max. 133°, 2 P.M., bright sunshine 12 hrs.
Mean dew point 69.3°, mean force vapor .9251, mean humidity 80.3.
Wind, S., total movement 102 m., mean hourly vel. 4.3 m., max pressure 1 3-4 lbs.=19 m. per hour, 10-30 P.M. Ozone 5.

25. Barometer reduced to sea level, max. 29.83, min. 29.69, mean 29.739.
Temperature, max. 85°, 88°, 6 P.M., min. 66.5°, 65°, 5 A.M., mean hourly 75.9°
Sun Thermometer, max. 136°, 10 A.M., bright sunshine 14 hrs.
Mean dew point 62°, mean force vapor .9822, mean humidity 60.7.
Wind, N., total movement 177 m., mean hourly vel. 7.4 m., max. pressure 6 3-4 lbs.=37 m. per hour, 12 M. Ozone 10.

26. Barometer reduced to sea level, max. 29.77, min. 29.72, mean 29.758,
Temperature, max. 79°, 80.5°, 6 P.M., min. 63°, 59°, 12 P.M., mean hourly 71.3°.
Sun Thermometer, max. 126°, 10.30 A.M., bright sunshine 10 hrs.
Mean dew point 54.7°, mean force vapor .7993, mean humidity 55.
Wind, N., total movement 204 m., mean hourly vel. 8.5 m., max. pressure 8 lbs.=40 m. per hour, 12 M. Ozone 10.

27. Barometer reduced to sea level, max. 29.85, min. 29.75, mean 29.823.
Temperature.max.74.5°,80.5°, 6 P.M., min.59.5°,55.5°,12 P.M.,mean hourly 66.2°
Sun Thermometer, max. 123°, 11 A.M., bright sunshine 11 hrs.
Mean dew point 57.7°, mean force vapor .6902, mean humidity 71.
Wind, N., total movement 194 m., mean hourly vel. 8.1 m., max. pressure 10 lbs.=45 m. per hour, 9-30 A.M. Ozone 10.

28. Barometer reduced to sea level, max. 29.85, min. 29.705, mean 29.805.
Temperature, max. 83.5°, 83.5°, 5 P.M., min. 57°, 52.5°, 4 A.M., mean hourly,70.5°.
Sun Thermometer, max. 138°, 11 A.M., bright sunshine 13 hrs.
Mean dew point 56.3°, mean force vapor .8079, mean humidity 60.7.
Wind. N., total movement 84 m., mean hourly vel. 3.5 m., max. pressure 4 lbs.=28 m. per hour, 12-30 P.M. Ozone 30.

29. Barometer reduced to sea level, max. 29.92, min. 29.805, mean 29.885.
Temperature, max. 79°, 82°, 4 P.M., min. 54.5°, 52°, 5 A.M., mean hourly 67.7°.
Sun Thermometer, max. 135°, 2 P.M., bright sunshine 10 hrs.
Mean dew point 60°, mean force vapor .7861, mean humidity 70.3.
Wind, N.E., total movement 93 m., mean hourly vel. 3.9 m., max. pressure 3 lbs.=24 m. per hour, 1 P.M. Ozone 5.

30. Barometer reduced to sea level, max. 29.95, min. 29.865, mean 29.913.
Temperature, max. 86°, 87°, 4 P.M., min. 59°, 55°, 5 A.M., mean hourly 73.3°.
Sun Thermometer, max. 142°, 10-30 A.M., bright sunshine 15 hrs.
Mean dew point 63.3°, mean force vapor .9166, mean humidity 67.7.
Wind. S.W., total movement 81 m., mean hourly vel. 3.4 m., max. pressure 1-5 lb=6 m. per hour, 2 P.M. Ozone 40.

C. D. WARNER, Meteorologist.

BULLETIN No. 19. JULY, 1890.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 18.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 29.98; actual minimum reading 29.37; Mean reduced to sea level, 30.019; Monthly Range, .61 in.

******Air Temperature.*** In Degrees Fahrenheit. Highest, 92°; 94°; Lowest, 47°; 40°; Mean, 69.8°; 68.4°; Monthly Range, 45°, 54°: Highest Mean Daily, 80°, 81°; Lowest Mean Daily, 59.6°, 55°; Mean Maximum, 79.3°, 81.2°; Mean Minimum, 59.3°, 55.6°; Mean Daily Range, 20.1°, 25.6°; Greatest Daily Range, 32°; 36.5°. Least Daily Range, 4.5°; 8.5°.

Humidity. Mean Dew Point, 61.5°; Mean Force of Vapor, .8229; Mean Relative Humidity, 70.1.

Wind. Prevailing Directions, S. S. W. 20 per cent., S. 17 per cent., S.W. 15 per cent., N. 9 per cent., other directions 39 per cent.; Total Movement, 3976 miles; Greatest Daily Movement, 265 m., 3d; Least Daily Movement, 32 m. 28th; Mean Daily Movement, 128.2 miles; Mean Hourly Velocity, 5.3 miles; Maximum Pressure per Square Foot, 9¾ lbs.=41 m. per hour, 19th, at 3 P. M.

Precipitation. In inches. Total Precipitation, 5.23 in.; at base of tower 5.63 in.

Weather. Mean Cloudiness observed, 56 per cent; Number of Clear Days, 18; Number of Cloudy Days, 3; Number of Fair Days, 10; Total Cloudiness recorded by the Sun Thermometer, 161 hrs., or 36per cent. Number of days on which .01 inches or more rain fell, 9.

Bright Sunshine. Number of Hours Recorded, 289.

Hail, a trace, 19th.

Mean Ozone, 50.6 per cent.

Halos, Solar, 27, 28; Lunar, 28th. Northern Lights, 17th.

Thunder and Lightning, 4th, 7th, 17th, 19th, 26th, 30th, 31st.

DAILY SUMMARY.

July 1. Barometer reduced to sea level, max. 29.98, min. 29.91, mean 29.948.
*Temperature, max. 87°, 89.5°, 2 P.M., min. 62°, 59°, 5 A.M, mean hourly 74.8°.
Sun Thermometer, max. 145°, 1 P.M., bright sunshine 12 hrs.
Mean dew point 66.7°, mean force vapor 1.0137, mean humidity 68.
Wind, S., total movement, 132 m., mean hourly velocity 5.5 m., max. pressure, 2 1-4 lbs.=21 m. per hour, 4-30 P.M. Ozone 40.

2. Barometer reduced to sea level, max. 29.95, min. 29.875, mean 29.92.
Temperature, max. 75.5°, 79.5°, 11 A.M., min. 65°, 63.5°, 4 A.M., mean hourly 70.4°
Sun Thermometer, max. 112°, 10 A.M., bright sunshine 2 hrs.
Mean dew point 68°, mean force vapor .8900, mean humidity 77.3.
Wind, S.S.W., total movement 219 m., mean hourly vel. 9.1 m., max. pressure 5 lbs.= 32 m. per hour, 3 P.M. Light showers of rain fell between 6 P.M. and 8 P.M. Only a trace of water fell. Ozone 60.

3. Barometer reduced to sea level, max. 29.875, min. 29.77, mean 29.782.
Temperature, max. 70.5°, 73.5°, 1 P.M., min. 66°, 65°, 2 A.M., mean hourly 68.1°.
Sun Thermometer, max. 63°, 1 P.M., bright sunshine 0.
Mean dew point 68°, mean force vapor .7762, mean humidity 87.7.
Wind, S., total movement 265 m., mean hourly vel. 11 m., max. pressure 5 lbs.=32 m. per hour, 12-30 P.M. Light showers of rain fell between 5 A. M. and 8 P.M. Ozone 50.

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*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to sea level, max. 29.78, min. 29.76, mean 29.767.
Temperature, max. 81.5°, 83°, 2 P.M., min. 67°, 65.5°, 1 A.M., mean hourly 72.1°.
Sun Thermometer, max. 133°, 10-30 A.M., bright sunshine 5 hrs.
Mean dew point 71.7°, mean force vapor .9494, mean humidity 83.7.
Wind, S. S.W., total movement 119 m., mean hourly vel. 5 m., max. pressure 1 1-2 lbs.=17 m. per hour, 0 A.M. Rain fell in showers between 7 A.M. and 7-30 P.M. .33 in. water fell on the 3rd and 4th; at base of tower .27 in. Ozone 60.

5. Barometer reduced to sea level, max. 30.045, min. 29.775, mean 29.922.
Temperature, max. 77.5°, 77°, 6 P.M., min. 62°, 58°, 12 P.M., mean hourly 70.3°.
Sun Thermometer, max. 125°, 12 M., bright sunshine 13 hrs.
Mean dew point 58.3°, mean force vapor .7483, mean humidity 67.
Wind, N. W., total movement 119 m., mean hourly vel. 5 m., max. pressure 2 lbs.=20 m. per hour, 12 M. Ozone 70.

6. Barometer reduced to sea level, max. 30.115, min. 30.045, mean 30.082.
Temperature, max. 86°, 83.5°, 6 P.M., min 54°, 48°, 5 A.M., mean hourly 69.3°.
Sun Thermometer, max. 135°, 1-30 P.M., bright sunshine 15 hrs.
Mean dew point 59°, mean force vapor .7378, mean humidity 71.7.
Wind, N.E., total movement 36 m., mean hourly vel. 1.5 m., max. pressure 1 3-4 lbs.=19 m. per hour, 11-30 A.M. Ozone 30.

7. Barometer reduced to sea level, max. 30.09, min. 29.975, mean 30.052.
Temperature, max. 84°, 87°, 4 P.M., min. 58°, 53°, 3 A.M., mean hourly 71.5°.
Sun Thermometer, max. 139°, 10-30 A.M., bright sunshine 12 hrs.
Mean dew point 65.7°, mean force vapor .8761, mean humidity 75.3.
Wind, S., total movement 76 m., mean hourly vel. 3.2 m., max. pressure 2 3-4 lbs.=23 m. per hour, 6-30 P.M. Showers of rain fell between 7 P.M. and 9-30 P.M., accompanied by vivid lightning and heavy thunder, at about 9 P.M. .10 in. water fell; at base of tower .11 in. Ozone 30.

8. Barometer reduced to sea level. max. 30.01, min. 29.665, mean 29.812.
Temperature, max. 92°, 94°, 4 P.M., min. 65.5°, 63.5°, 4 A.M., mean hourly 79.5°
Sun Thermometer, max. 135°, 1-30 P.M., bright sunshine 15 hrs.
Mean dew point 72.7°, mean force vapor 1.1953, mean humidity 70.3.
Wind. S.S.W., total movement 138 m., mean hourly vel. 5.8 m., max. pressure 3 lbs.=24 m. per hour, 2-30 P.M. Ozone 50.

9. Barometer reduced to sea level, max. 29.955, min. 29.64, mean 29.767.
Temperature, max. 77°, 84°, 1 A.M., min. 54.5°, 58°, 12 P.M., mean hourly 71.2°
Sun Thermometer, max. 123°, 9-30 A.M., bright sunshine 13 hrs.
Mean dew point 48.7°, mean force vapor .7795, mean humidity 45.
Wind, N.W., total movement 243 m., mean hourly vel. 10.1 m., max. pressure 7 3-4 lbs.=40 m. per hour, 11-30 A.M. Ozone 40.

10. Barometer reduced to sea level, max. 30.125, min. 29.955, mean 30.05.
Temperature, max. 67°, 70°, 3 P.M., min. 47°, 40°, 5 A.M., mean hourly 69.3°.
Sun Thermometer, max. 118°, 12 M., bright sunshine 9 hrs.
Mean dew point 47.7°, mean force vapor .5733, mean humidity 59.3.
Wind, N.N.E., total movement 152 m., mean hourly vel. 6.3 m., max. pressure 8 3-4 lbs.=42 m. per hour, 9-30 A.M. Ozone 60.

11. Barometer reduced to sea level, max. 30.215, min. 30.125, mean 30.193.
Temperature, max. 78°, 76.5°, 5 P.M., min. 53.5°, 47°. 4 A.M., mean hourly 66.7°.
Sun Thermometer, max. 137°, 2 P.M., bright sunshine 9 hrs.
Mean dew point 52.3°, mean force vapor .6372, mean humidity 64.3.
Wind, N.N.E., total movement 115 m., mean hourly vel. 4.8 m., max. pressure 4 1-2 lbs.=30 m. per hour, 12 M. Ozone 50.

12. Barometer reduced to sea level, max. 30.21, min. 30.075, mean 30.163.
Temperature, max. 77.5°, 79°, 2 P.M., min. 49.5°, 43°, 4 A.M., mean hourly 64°
Sun Thermometer, max. 141°, 12 M., bright sunshine 8 hrs.
Mean dew point 53.7°, mean force vapor .6865, mean humidity 64.7.
Wind, S.S.W., total movement 90 m., mean hourly vel. 3.8 m., max. pressure 3 1-4 lbs.=25 m. per hour, 5 P.M. A trace of water fell in light showers between 5 P.M. and 7 P.M. Ozone 40.

13. Barometer reduced to sea level, max. 30.095, min. 30.055, mean 30.075.
Temperature, max. 74.5°, 77°, 2 P.M., min. 58°, 55°, 4 A.M., mean hourly 65.5°.
Sun Thermometer, max. 130°, 1-30 P.M., bright sunshine 6 hrs.

Mean dew point 57.3°, mean force vapor .7301, mean humidity 67.7.
Wind, S., total movement 190 m., mean hourly vel. 7.9 m., max. pressure 2 1-2 lbs.=22 m. per hour, 12-30 P.M. Ozone 40.

14. Barometer reduced to sea level, max. 30.10, min. 30.025, mean 30.068.
Temperature, max. 79°, 81°, 5 P.M., min. 53°, 48°, 4 A.M., mean hourly 66.5°.
Sun Thermometer, max. 128°, 11 A.M., bright sunshine 10 hrs.
Mean dew point 62.7°, mean force vapor .7440, mean humidity 79.7.
Wind, S.S.W., total movement 91 m., mean hourly vel. 3.8 m., max. pressure 1 1-4 lbs.=16 m. per hour, 2.30 P.M. Ozone 60.

15. Barometer reduced to sea level, max. 30.065, min. 29.95, mean 29.998.
Temperature, max. 84°, 89°, 1 P.M., min. 65°, 63°, 1 A.M., mean hourly 73.1°
Sun Thermometer, max. 136°, 10-30 A.M., bright sunshine 6 hrs.
Mean dew point 69.7°, mean force vapor .9657, mean humidity 76.3.
Wind, S.S.W., total movement 168 m., mean hourly vel. 7 m., max. pressure 2 1-4 lbs.=21 m. per hour, 5.30 P.M. A shower of rain fell between 5 P.M. and 5-30 P.M. .025 in. water fell; at base of tower .03 in. Ozone 70.

16. Barometer reduced to sea level, max. 30.055, min. 29.99, mean 30.037.
Temperature, max. 89°, 90.5°, 6 P.M., min. 66.5°, 64°. 4 A.M., mean hourly 77.5°.
Sun Thermometer, max. 140°, 10-30 A.M., bright sunshine 14 hrs.
Mean dew point 63.7°, mean force vapor 1.052, mean humidity 59.7.
Wind, N. W., total movement 119 m., mean hourly vel. 5 m., max. pressure 3 1-4 lbs.=25 m. per hour, 3 P.M. Ozone 90.

17. Barometer reduced to sea level, max. 30.055, min. 29.77, mean 29.890.
Temperature, max. 84°, 85.5°, 1 P.M., min. 61°, 57°. 4 A.M., mean hourly 72.8°
Sun Thermometer, max. 137°, 10-30 A.M., bright sunshine 7 hrs.
Mean dew point 65.3°, mean force vapor .936, mean humidity 69.
Wind, S.W.. total movement 46 m., mean hourly vel. 1.9 m., max. pressure 5 1-2 lbs.=32 m. per hour, 6 P.M. A trace of rain fell in showers between 2-30 P.M. and 4-30 P.M. Ozone 60.

18. Barometer reduced to sea level, max. 29.965, min. 29.78, mean 29.923.
Temperature, max. 77.5°, 76.5°, 6 P.M., min. 58.5°, 55°, 12 P.M., mean hourly 67.6°
Sun Thermometer, max. 124°, 1 P.M., bright sunshine 13 hrs.
Mean dew point 50.3°, mean force vapor .6752, mean humidity 57.3.
Wind. N., total movement 163 m., mean hourly vel. 6.8 m., max. pressure 8 1-4 lbs.=41 m. per hour, 7-30 A.M. Ozone 70.

19. Barometer reduced to sea level, max. 29.92, min. 29.87, mean 29.933.
Temperature, max. 68.5°, 71.5°, 2 P.M.. min. 51°, 43°, 3 A.M., mean hourly 60.3°.
Sun Thermometer. max. 117°, 2 P.M.. bright sunshine 4 hrs.
Mean dew point 47.3°, mean force vapor .5889, mean humidity 57.
Wind, N.N.W., total movement 176 m., mean hourly vel. 7.3 m., max. pressure 9 3-4 lbs.=44 m. per hour, 3 P.M. Light showers of rain fell between 10-30 A.M., and 3-30 P.M. A trace of hail fell at about 3 P.M. .03 in water fell; at base of tower .05 in. Ozone 60.

20. Barometer reduced to sea level, max. 30.205, min. 30.01, mean 30.12.
Temperature, max. 69°, 72.5°, 3 P.M., min. 50°, 43°, 4 A.M., mean hourly 59.6°.
Sun Thermometer. max. 133°, 11-30 A.M., bright sunshine 9 hrs.
Mean dew point 53.3°, mean force vapor .5736, mean humidity 74.7.
Wind, N., total movement 123 m., mean hourly vel. 5.1 m., max. pressure 2 3-4 lbs.=23 m. per hour, 10-30 A.M. A light shower of rain fell between 12-30 P.M. and 1 P.M. .01 in. water fell; at base of tower .015 in. Ozone 70.

21. Barometer reduced to sea level, max. 30.25, min. 30.19, mean 30.228.
Temperature, max. 74.5°, 77°, 4 P.M., min. 47°, 40.5°, 4 A.M., mean hourly 62.3°.
Sun Thermometer, max. 134°, 2 P.M., bright sunshine 13 hrs.
Mean dew point 49.7°, mean force vapor .5939, mean humidity 64.7.
Wind, N.N.E., total movement 93 m., mean hourly vel. 3.9 m., max. pressure 7 3-4 lbs.=39 m. per hour, 10 A.M. Ozone 60.

22. Barometer reduced to sea level, max. 30.265, min. 30.175, mean 30.222.
Temperature. max. 78°, 79°, 3 P.M. min., 48°, 42.5°, 4 A.M., mean hourly 64.9°.
Sun Thermometer, max. 144°, 12 M., bright sunshine 14 hrs.
Mean dew point 52.7°, mean force vapor .6972, mean humidity 61.
Wind, S.W., total movement 53 m., mean hourly vel. 2.2 m., max. pressure 3-4 lbs.=12 m. per hour, 11-30 P.M. Ozone 40.

23. Barometer reduced to sea level, max. 30.24, min. 30.165. mean 30.21.
Temperature, max. 76°, 79.5°, 1 P.M., min. 57°, 54.5°, 12 P.M., mean hourly 66.4°
Sun Thermometer, max. 128°, 2 P.M., bright sunshine 14 hrs.
Mean dew point 54.3°, mean force vapor .7306. mean humidity 61.7.
Wind, S., total movement 189 m., mean hourly vel. 7.9 m, max. pressure 4 1-2 lbs.=26 m. per hour, 6-30 P.M. Ozone 50.

24. Barometer reduced to sea level, max. 30.20, min. 30.145, mean 30.167.
Temperature. max. 74.5°,76°, 11 A.M., min. 56.5°,51.5°, 4 A.M., mean hourly 66.5°
Sun Thermometer. max. 136°, 10 A.M., bright sunshine 5 hrs.
Mean dew point 60.7°, mean force vapor .7368, mean humidity 72.7.
Wind, S., total movement 120 m., mean hourly vel. 5 m., max pressure 3 1-4 lbs.=25 m. per hour, 5 P.M. Ozone 30.

25. Barometer reduced to sea level, max. 30.145, min. 29.955, mean 30.007.
Temperature, max. 70°, 71.5°, 2 P.M., min. 62.5°, 61°, 5 A.M., mean hourly 65.9°.
Sun Thermometer, max. 67°, 11-30 A.M., bright sunshine 0.
Mean dew point 67°, mean force vapor .7135, mean humidity 93.3.
Wind, S., total movement 72 m., mean hourly vel. 3 m., max. pressure 3-4 lbs.=12 m. per hour, 12 P.M. Rain began falling at about 2 A.M. and ceased at about 5 P.M. 1.82 in. water fell; at base of tower 2.03 in. Ozone 30.

26. Barometer reduced to sea level, max. 29.975, min. 29.83, mean 29.978,
Temperature, max. 80°, 81°, 6 P.M., min. 66°, 65.5°, 9 A.M., mean hourly 70.1°.
Sun Thermometer, max. 121°, 3-30 P.M., bright sunshine 4 hrs.
Mean dew point 70°, mean force vapor .8049, mean humidity 90.3.
Wind, S., total movement 166 m., mean hourly vel. 6.9 m., max. pressure 2 lbs.=20 m. per hour, 4-30 A.M. Rain became falling at about 1-30 A. M. and ceased at about 8-30 P.M. Thunder and lightning occurred at 8 P. M. 2.80 in. water fell; at base of tower 2.83 in. Ozone 70.

27. Barometer reduced to sea level, max. 30.12. min. 29.96, mean 30.053.
Temperature, max. 82.5°, 82.5°, 5 P.M., min. 64.5°, 61.5°, 6 A.M., mean hourly 72.6°
Sun Thermometer, max. 163°, 10-30 A.M., bright sunshine 14 hrs.
Mean dew point 66.3°, mean force vapor .8719, mean humidity 77.3.
Wind. S.W., total movement 78 m., mean hourly vel. 3.2 m., max. pressure 1 3-4 lbs.=19 m. per hour, 12-30 P.M. Ozone 50.

28. Barometer reduced to sea level. max. 30.205. min. 30.22, mean 30.187.
Temperature, max. 87°, 88°, 3 P.M., min. 59.5°, 55°, 5 A.M., mean hourly 73.8°.
Sun Thermometer, max. 143°, 12 M., bright sunshine 14 hrs.
Mean dew point 68°, mean force vapor .9783, mean humidity 74.7.
Wind. S.W., total movement 32 m., mean hourly vel. 1.3 m., max. pressure .1 lb.=5 m. per hour, 7-30 P.M. Ozone 40.

29. Barometer reduced to sea level. max. 30.23. min. 30.12, mean 30.178.
Temperature, max. 80°, 80.5°, 2 P.M., min. 69°, 66.5°, 5 A.M., mean hourly 73.5°.
Sun Thermometer, max. 135°, 1-30 P.M., bright sunshine 7 hrs.
Mean dew point 79.7°, mean force vapor .9591, mean humidity 76.7.
Wind, S.S.W., total movement 106 m., mean hourly vel. 4.4 m., max. pressure 1 1-4 lbs.=16 m. per hour, 6-30 A.M. Traces of rain fell during the forenoon. Ozone 30..

30. Barometer reduced to sea level, max. 30.12, min. 29.965, mean 30.03.
Temperature, max. 88.5°, 90.5°, 3 P.M., min. 67.5°, 64.5°, 6 A.M., mean hourly 76.9°
Sun Thermometer, max. 131°, 4-30 P. M., bright sunshine 11 hrs.
Mean dew point 64°, mean force vapor 1.1871, mean humidity 57.
Wind, S.W., total movement 122 m., mean hourly vel. 5.1 m., max. pressure 2 3-4 lbs=23 m. per hour, 2 P.M. A thunder shower occurred at about 6 P.M. Only a trace of rain fell. Ozone 20.

31. Barometer reduced to sea level, max. 29.98. min. 29.745, mean 29.847.
Temperature, max. 90°, 92.5°, 1 P.M., min. 72°, 69.5°, 4 A.M., mean hourly 80°
Sun Thermometer, max. 128°, 10-30 A.M., bright sunshine 12 hrs.
Mean dew point 71.7°, mean force vapor 1.1777, mean humidity 67.7.
Wind, S.W., total movement 165 m., mean hourly vel. 6.9 m., max. pressure 4 1-4 lbs.=29 m. per hour, 5-30 P.M. A light thunder shower occurred about 4-30 P.M. Rain began falling again at 9 P.M. and ceased about 10-30 P.M. .11 in. water fell; at base of tower .13 in. Ozone 50.

C. D. WARNER, Meteorologist.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS

BULLETIN No. 20. AUGUST, 1890.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.00; actual minimum reading 29.18; Mean reduced to sea level, 30.001; Monthly Range, .82 in.

****Air Temperature.*** In Degrees Fahrenheit. Highest, 86.5°; 88.5°; Lowest, 47°; 41.5°; Mean, 67.2°; 67.2°; Monthly Range, 39.5°, 47°; Highest Mean Daily, 77°, 78°; Lowest Mean Daily, 54.9°, 56.5°; Mean Maximum, 75°, 78.2°; Mean Minimum, 59.3°, 56.2°; Mean Daily Range, 15.7, 22°; Greatest Daily Range, 23°; 30.5°. Least Daily Range, 6°; 15.5°.

Humidity. Mean Dew Point, 57.2°; Mean Force of Vapor, .8326; Mean Relative Humidity, 71 9.

Wind. Prevailing Directions, S. 16 per cent., N. 14 per cent., S.W. 14 per cent., S.S.W. 10 per cent., other directions 46 per cent.; Total Movement, 4116 miles; Greatest Daily Movement, 250 m., 5th; Least Daily Movement, 52 m. 8th; Mean Daily Movement, 132.8 miles; Mean Hourly Velocity, 5.5 miles; Maximum Pressure per Square Foot, 13 lbs.=51 m. per hour, 19th, at 9-30 P. M.

Precipitation. In inches. Total Precipitation, 4.06 in.; at base of tower 4.88 in.

Weather. Mean Cloudiness observed, 57.1 per cent; Number of Clear Days, 8; Number of Cloudy Days, 15; Number of Fair Days, 8; Total Cloudiness recorded by the Sun Thermometer, 230 hrs., or 53.6 per cent. Number of days on which .01 inches or more rain fell, 14.

Bright Sunshine. Number of Hours Recorded, 199.

Mean Ozone, 58.7 per cent.

Halos, Lunar corona, 28th.

Thunder and Lightning, 1st, 5th, 14th, 17th, 19th.

Aurora, 14th, 18th. Gales 17th and 20th.

DAILY SUMMARY.

Aug 1. Barometer reduced to sea level, max. 30.095, min. 29.845, mean 29.997
*Temperature, max. 85.5°, 86°, 4 P.M., min. 69°, 68°, 12 P.M, mean hourly 75°.
Sun Thermometer, max. 135°, 12-30 P.M., bright sunshine 4 hrs.
Mean dew point 68.7°, mean force vapor .9249, mean humidity 77.3.
Wind, S.E., total movement, 111 m., mean hourly velocity 4.6 m., max. pressure, 1 1-5 lbs.=15 m. per hour, 11-30 A.M. Rain began falling about 2 A. M. and ceased about 7 A. M. .10 in. water fell; at base of tower .12 in. Ozone 60.

2. Barometer reduced to sea level, max. 30.205, min. 30.095, mean 30.167.
Temperature, max. 86.5°, 87.5°, 3 P.M., min. 66°, 63.5°, 2 A.M., mean hourly 75.1°.
Sun Thermometer, max. 140°, 10-30 A.M., bright sunshine 14 hrs.
Mean dew point 67.3°, mean force vapor .9911, mean humidity 69.
Wind, S., total movement 102 m., mean hourly vel. 4.3 m., max. pressure 2 lbs.= 20 m. per hour, 4 P.M. Ozone 50.

3. Barometer reduced to sea level, max. 30.235, min. 30.12, mean 30.17.
Temperature, max. 82°, 84°, 3 P.M., min. 62.5°, 60.5°, 5 A.M., mean hourly 72.4°.
Sun Thermometer, max. 130°, 10-30 A.M., bright sunshine 12 hrs.
Mean dew point 66.3°, mean force vapor .9168, mean humidity 72.7.
Wind, S.S.W., total movement 138 m., mean hourly vel. 5.8 m., max. pressure 2 1-2 lbs.=22 m. per hour, 7-30 P.M. Ozone 50.

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*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to sea level, max. 30.13, min. 30.045, mean 30.105.
Temperature, max. 85°, 87°, 3 P.M., min. 70°, 68.5°, 1 A.M., mean hourly 76.5°.
Sun Thermometer, max. 120°, 1-30 P.M., bright sunshine 8 hrs.
Mean dew point 72°, mean force vapor 1.0652, mean humidity 74.7.
Wind, S., total movement 205 m., mean hourly vel. 8.5 m., max. pressure 3 1-2 lbs.=26 m. per hour, 7 P.M. Ozone 70.

5. Barometer reduced to sea level, max. 30.155, min. 30.08, mean 30.108.
Temperature, max. 83.5°, 86°, 1 P.M., min. 71.5°, 70°, 3 A.M., mean hourly 77°.
Sun Thermometer, max. 120°, 11 A.M., bright sunshine 11 hrs.
Mean dew point 70.7°, mean force vapor 1.0207, mean humidity 75.
Wind, S.W., total movement 250 m., mean hourly vel. 10.4 m., max. pressure 9 1-2 lbs.=44 m. per hour, 3 P.M. Ozone 40.

6. Barometer reduced to sea level, max. 30.085, min. 30.00, mean 30.05.
Temperature, max. 83°, 88.5°, 5 P.M., min 65°, 67°, 12 P.M., mean hourly 74.6°
Sun Thermometer, max. 138°, 11-30 A.M., bright sunshine 6 hrs.
Mean dew point 64.3°, mean force vapor .8948, mean humidity 69.7.
Wind, W., total movement 162 m., mean hourly vel. 6.8 m., max. pressure 3 1-2 lbs.=26 m. per hour, 12-30 A.M. Light showers of rain began falling about 5 A.M. and ceased about 7 A.M. Only a trace of water fell. Ozone 90.

7. Barometer reduced to sea level, max. 30.135, min. 30.07, mean 30.103.
Temperature, max. 77°, 80.5°, 3 P.M., min. 61°, 56°, 5 A.M., mean hourly 69.1°.
Sun Thermometer, max. 135°, 10 A.M., bright sunshine 7 hrs.
Mean dew point 59°, mean force vapor .7553, mean humidity 68.7.
Wind, N., total movement 72 m., mean hourly vel. 3 m., max. pressure 1-2 lb.=10 m. per hour, 12-30 P.M. Ozone 60.

8. Barometer reduced to sea level, max. 30.15, min. 30.055, mean 30.103.
Temperature, max. 77°, 79.5°, 2 P.M., min. 57.5°, 54.5°, 5 A.M., mean hourly 68.5°
Sun Thermometer, max. 137°, 12 M., bright sunshine 3 1-2 hrs.
Mean dew point 64°, mean force vapor .8091, mean humidity 76.3.
Wind, S.S.W., total movement 52 m., mean hourly vel. 2.2 m., max. pressure 1-2 lb.=10 m. per hour, 8-30 P.M. Ozone 50.

9. Barometer reduced to sea level, max. 30.055, min. 29.855, mean 29.955.
Temperature, max. 68.5°, 72°, 11 A.M., min. 62.5°, 52°, 5 A.M., mean hourly 65.6°
Sun Thermometer, max. 78°, 2 P.M., bright sunshine 0.
Mean dew point 64.3°, mean force vapor .7169, mean humidity 84.3.
Wind, S.S.E., total movement 72 m., mean hourly vel. 3 m., max. pressure 1 lb.=14 m. per hour, 11-45 A.M. Light showers of rain began falling about 10 A.M. and ceased about 6 P.M. .04 in. water fell; at base of tower .06 in. Ozone 40.

10. Barometer reduced to sea level, max. 29.855, min. 29.68, mean 29.737.
Temperature, max. 80.5°, 83.5°, 1 P.M., min. 61.5°, 62°, 12 P.M., mean hourly 68.8°
Sun Thermometer, max. 140°, 12 M., bright sunshine 3 hrs.
Mean dew point 61°, mean force vapor .7973, mean humidity 69.3.
Wind, N.N.W., total movement 106 m., mean hourly vel. 4.4 m., max. pressure 1 3-4 lbs.=18 m. per hour, 6-30 P.M. Rain began falling about 1-30 A. M. and ceased about 3 A. M. A light shower also took place about 3 P. M. .21 in. water fell: at base of tower .23 in. Ozone 60.

11. Barometer reduced to sea level, max. 29.975, min. 29.725, mean 29.848.
Temperature, max. 68°, 73°, 12 M., min. 55°, 49.5°, 4 A.M., mean hourly 63°.
Sun Thermometer, max. 121°, 9 A.M., bright sunshine 3 hrs.
Mean dew point 55.3°, mean force vapor .6408, mean humidity 69.7.
Wind, N., total movement 118 m., mean hourly vel. 4.9 m., max. pressure 2 1-2 lbs.=22 m. per hour, 2 P.M. Ozone 50.

12. Barometer reduced to sea level, max. 30.15, min. 29.975, mean 30.088.
Temperature, max. 70°, 74°, 10 A.M., min. 58°, 56.5°, 3 A.M., mean hourly 65°.
Sun Thermometer, max. 119°, 10 A.M., bright sunshine 6 hrs.
Mean dew point 58°, mean force vapor .6557, mean humidity 74.
Wind, N.E., total movement 221 m., mean hourly vel. 9.2 m., max. pressure 5 lbs.=32 m. per hour, 8.30 A.M. Rain fell between 1 A.M. and 6 A.M. .07 in. water fell; at base of tower .12 in. Ozone 50.

13. Barometer reduced to sea level, max. 30.16, min. 30.045, mean 30.122.
Temperature, max. 69.5°, 73°, 12 M., min. 55°, 53°, 3 A.M., mean hourly 63.4°.
Sun Thermometer, max. 91°, 12 M., bright sunshine 0.
Mean dew point 61.3°, mean force vapor .6442, mean humidity 85.

Wind, N.N.E., total movement 124 m., mean hourly vel. 5.2 m., max. pressure 3-4 lb.=12 m. per hour, 8 A.M. Ozone 50.

14. Barometer reduced to sea level, max. 30.045, min. 29.905, mean 29.965.
Temperature, max. 76°,81.5°, 2 P.M., min. 58.5°,54.5°, 3 A.M., mean hourly 66.9°
Sun Thermometer, max. 135°, 1 P.M., bright sunshine 7 hrs.
Mean dew point 59.7°, mean force vapor .7750, mean humidity 67.7.
Wind, S.W., total movement 67 m., mean hourly vel. 2.8 m., max. pressure 2 1-4 lbs.=21 m. per hour, 8 P.M. A trace of rain fell in light showers during the afternoon. Ozone 60.

15. Barometer reduced to sea level, max. 30.145, min. 29.94, mean 29.997.
Temperature, max. 78°, 82°, 2 P.M., min. 57.5°,53.5°, 12 P.M., mean hourly 68.5°
Sun Thermometer, max. 132°, 11 A.M., bright sunshine 11 hrs.
Mean dew point 56.7°, mean force vapor .7669, mean humidity 63.7.
Wind, W.N.W., total movement 88 m., mean hourly vel. 3.7 m., max. pressure 2 1-2 lbs.=22 m. per hour, 12.30 P.M. Ozone 60.

16. Barometer reduced to sea level, max. 30.28, min. 30.15, mean 30.232.
Temperature, max. 74°, 77°, 1 P.M., min. 51.5°, 44.5°, 4 A.M., mean hourly 66.3°.
Sun Thermometer, max. 130°, 10 A.M., bright sunshine 14 hrs.
Mean dew point 54°, mean force vapor .6438, mean humidity 66.3.
Wind, S. W., total movement 106 m., mean hourly vel. 4.4 m., max. pressure 1 lb.=14 m. per hour. 2-30 P.M. Ozone 40.

17. Barometer reduced to sea level, max. 30.215, min. 30.00, mean 30.10.
Temperature, max. 81°, 81°, 12 M., min. 65.5°. 56°, 2 A.M., mean hourly 72.1°.
Sun Thermometer, max. 123°, 9-15 A.M., bright sunshine 6 hrs.
Mean dew point 66.7°, mean force vapor .8691, mean humidity 78.
Wind, S.W., total movement 220 m., mean hourly vel. 9.2 m., max. pressure 12 lbs.=49 m. per hour, 6-15 P.M. A heavy thunder storm blew up about 7 P.M. More or less rain fell all night. Ozone 10.

18. Barometer reduced to sea level, max. 30.235, min. 30.00, mean 30.17.
Temperature, max. 75°, 78°, 3 P.M., min. 54.5°, 57.5°, 12 P.M., mean hourly 66.3°
Sun Thermometer, max. 128°, 1 P.M., bright sunshine 7 hrs.
Mean dew point 57°, mean force vapor .6605, mean humidity 72.
Wind, N.N.E., total movement 125 m., mean hourly vel. 5.2 m., max. pressure 3-4 lbs.=12 m. per hour, 9 A.M. The storm of the 17th ceased about 6 A.M. .74 in. water fell; at base of tower .87 in. Ozone 70.

19. Barometer reduced to sea level, max. 30.23, min. 29.935, mean 30.115.
Temperature, max. 72.5°, 76.5°, 3 P.M., min. 57°, 48°, 2 A.M., mean hourly 65.6°.
Sun Thermometer, max. 130°, 11 A.M., bright sunshine 2 hrs.
Mean dew point 58.3°, mean force vapor .6254, mean humidity 83.
Wind, S., total movement 79 m., mean hourly vel. 3.3 m., max. pressure 13 lbs.=51 m. per hour, 9-30 P.M. Rain began falling about 3-30 P.M. and continued falling throughout the following night. Ozone 60.

20. Barometer reduced to sea level, max. 30.16, min. 29.89, mean 30.077.
Temperature, max. 75°, 80°, 4 P.M., min. 62°, 60°, 12 P.M., mean hourly 68.3°.
Sun Thermometer, max. 138°, 1-30 P.M., bright sunshine 10 hrs.
Mean dew point 62°, mean force vapor .7171, mean humidity 80.
Wind, N.N.E., total movement 121 m., mean hourly vel. 5 m., max. pressure 5 1-2 lbs.=33 m. per hour, 1 A.M. The latter part of the storm of the 18th was accompanied by thunder, lightning and strong wind. Rain ceased falling about 5-30 A. M. 1.03 in. water fell; at base of tower 1.22 in. Ozone 40.

21. Barometer reduced to sea level, max. 30.165, min. 29.73, mean 29.985.
Temperature, max. 72°, 80.5°, 1 P.M., min. 60.5°, 62°, 5 A.M., mean hourly 66.2°.
Sun Thermometer, max. 114°, 1-30 P.M., bright sunshine 4 hrs.
Mean dew point 60°, mean force vapor .6765, mean humidity 78.3.
Wind, S.S.W., total movement 160 m., mean hourly vel. 6.7 m., max. pressure 1-2 lb.=10 m. per hour, 7 A.M. Rain fell in showers between 4 P.M. and 11 P.M. .35 in. water fell; at base of tower .48 in. Ozone 70.

22. Barometer reduced to sea level, max. 29.875, min. 29.73, mean 29.857.
Temperature, max. 77°, 77.5°, 4 P.M., min., 63.5°,57°, 2 A.M., mean hourly 69.3°.
Sun Thermometer, max. 136°, 12-15 P.M., bright sunshine 11 hrs.
Mean dew point 60.7°, mean force vapor .7330, mean humidity 72.3.
Wind, N.N.E., total movement 118 m., mean hourly vel. 4.9 m., max. pressure

1-4 lb.=7 m. per hour, 12-30 P.M. Rain began falling about 10-30 P. M. Ozone 60.

23. Barometer reduced to sea level, max. 30.025, min. 29.83, mean 29.945.
Temperature, max. 61°, 67.5°, 1 A.M., min. 51.5°, 51°, 12 P.M., mean hourly 55°.
Sun Thermometer, max. 31°, 9-30 A.M., bright sunshine 0.
Mean dew point 53.7°, mean force vapor .4376, mean humidity 95.
Wind, N.W., total movement 230 m., mean hourly vel. 9.6 m, max. pressure 4 1-4 lbs.=29 m. per hour, 4-30 P.M. Ozone 70.

24. Barometer reduced to sea level, max. 30.05, min. 30.02, mean 30.045.
Temperature, max. 63°, 66°, 4 P.M., min. 49°, 47°, 4 A.M., mean hourly 54.9°.
Sun Thermometer, max. 95°, 1 P.M., bright sunshine 1 hr.
Mean dew point 49.3°, mean force vapor .4783, mean humidity 76.7.
Wind, N.W., total movement 99 m., mean hourly vel. 4.1 m., max pressure 1 lb.=14 m. per hour, 5 P.M. Ozone 50.

25. Barometer reduced to sea level, max. 30.075, min. 29.98, mean 30.023.
Temperature, max. 70°, 72°, 4 P.M., min. 47°, 41.5°, 5 A.M., mean hourly 59.3°.
Sun Thermometer, max. 127°, 9 A.M., bright sunshine 7 1-2 hrs.
Mean dew point 51.3°, mean force vapor .5679, mean humidity 69.3.
Wind, S.S.W., total movement 98 m., mean hourly vel. 4.1 m., max. pressure 4 lbs.=28 m. per hour, 4 P.M. Ozone 60.

26. Barometer reduced to sea level, max. 30.005, min. 29.86, mean 29.947.
Temperature, max. 75°, 76.5°, 2 P.M., min. 55.5°, 52°, 3 A.M., mean hourly 65.2°.
Sun Thermometer, max. 130°, 12 M., bright sunshine 3 hrs.
Mean dew point 62.3°, mean force vapor .7049, mean humidity 82.7.
Wind, S.S.W., total movement 86 m., mean hourly vel. 3.6 m., max. pressure 1 lb.=14 m. per hour, 11 P.M. A light shower of rain fell about 6 A. M. Rain again began to fall about 11 P.M. and continued to fall throughout the night. Ozone 50.

27. Barometer reduced to sea level, max. 29.86, min. 29.46, mean 29.59.
Temperature, max. 74.5°, 78.5°, 4 P.M., min. 64.5°, 63°, 2 A.M., mean hourly 68.4°
Sun Thermometer, max. 120°, 2 P.M., bright sunshine 6 hrs.
Mean dew point 63.3°, mean force vapor .7291, mean humidity 80.3.
Wind, W.N.W., total movement 221 m., mean hourly vel. 9.2 m., max. pressure 4 3-4 lbs.=31 m. per hour, 5 A.M. The storm of the 26th ceased about 10 A.M. .95 in. water fell; at base of tower 1.07 in. Ozone 70.

28. Barometer reduced to sea level, max. 29.93, min. 29.73, mean 29.857.
Temperature, max. 74.5°, 77°, 5 P.M., min. 60.5°, 59.5°, 12 P.M., mean hourly 67.2°
Sun Thermometer, max. 121°, 1 P.M., bright sunshine 7 hrs.
Mean dew point 59.3°, mean force vapor .7221, mean humidity 71.
Wind, W., total movement 180 m., mean hourly vel. 7.5 m., max. pressure 2 1-4 lbs.=21 m. per hour, 10 A.M. Ozone 80.

29. Barometer reduced to sea level, max. 29.97, min. 29.785, mean 29.895.
Temperature, max. 75°, 78.5°, 3 P.M., min. 54°, 49°, 6 A.M., mean hourly 65.8°.
Sun Thermometer, max. 131°, 12 M., bright sunshine 13 hrs.
Mean dew point 59°, mean force vapor .7088, mean humidity 73.
Wind, S.W., total movement 80 m., mean hourly vel. 3.3 m., max. pressure 1-4 lb.=7 m. per hour, 9 P.M. Ozone 50.

30. Barometer reduced to sea level, max. 29.825, min. 29.70, mean 29.737.
Temperature, max. 71°, 74°, 12 M., min. 56.5°, 55.5°, 12 P.M., mean hourly 64.7°.
Sun Thermometer, max. 122°, 12-30 P. M., bright sunshine 6 hrs.
Mean dew point 56.7°, mean force vapor .6401, mean humidity 74.7.
Wind, N.W., total movement 168 m., mean hourly vel. 7 m., max. pressure 2 3-4 lbs=23 m. per hour, 2-30 P.M. Rain began to fall about 3 A. M. and ceased about 8-30 A.M. .19 in. water fell; at base of tower .20 in. Ozone 50.

31. Barometer reduced to sea level, max. 30.08, min. 29.83, mean 29.955.
Temperature, max. 64.5°, 67°, 1 P.M., min. 54.5°, 50.5°, 4 A.M., mean hourly 59.1°
Sun Thermometer, max. 117°, 10-30 A.M., bright sunshine 6 hrs.
Mean dew point 51.3°, mean force vapor .5225, mean humidity 73.7.
Wind, N.W., total movement 144 m., mean hourly vel. 6 m., max. pressure 2 lbs.=20 m. per hour, 4 P.M. Ozone 50.

C. D. WARNER, *Meteorologist.*

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

BULLETIN No. 21. SEPTEMBER, 1890

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.13; actual minimum reading 29.45; Mean reduced to sea level, 30.124; Monthly Range, .68 in.

****Air Temperature.*** In Degrees Fahrenheit. Highest, 79.°; 80.5°; Lowest, 32°; 28.5°; Mean, 59.7°; 60.4°; Monthly Range, 47°, 52°; Highest Mean Daily, 70.2°, 72.5°; Lowest Mean Daily, 46.2°, 45°; Mean Maximum, 67.8°, 71.8°; Mean Minimum, 5 .6°, 49.1°; Mean Daily Range, 16.2, 22.7°; Greatest Daily Range, 34°; 43.5°. Least Daily Range, 4°; 10°.

Humidity. Mean Dew Point, 55.8°; Mean Force of Vapor, .5800; Mean Relative Humidity, 80.9.

Wind. Prevailing Directions, N. 23 per cent., S. 20 per cent., N.N.E. 11 per cent., S.W. 10 per cent., other directions 36 per cent.; Total Movement, 3507 miles; Greatest Daily Movement, 281 m., 13th; Least Daily Movement, 32 m. 15th and 30th; Mean Daily Movement 116.9 miles; Mean Hourly Velocity, 4.9 miles; Maximum Pressure per Square Foot, 5 lbs.=32 m. per hour, 13th, at 11-30 A. M. and 24th at 11 A. M.

Precipitation. In inches. Total Precipitation, 4.86 in.; at base of tower 5.85 in.

Weather. Mean Cloudiness observed, 58.7 per cent; Number of Clear Days, 11; Number of Cloudy Days, 13; Number of Fair Days, 6; Total Cloudiness recorded by the Sun Thermometer, 221 1-2 hrs., or 58 per cent. Number of days on which .01 inches or more rain fell, 13.

Bright Sunshine. Number of Hours Recorded, 166.

Mean Ozone, 47 per cent.

Lunar corona, 25th, 30th.

Thunder and Lightning, 5th, 13th, 17th.

Frost, 25th. First of the season.

DAILY SUMMARY.

Sept. 1 Barometer reduced to sea level, max. 30.265, min 30.09, mean 30.217.
*Temperature, max. 70.5°, 79.5°, 1 P.M., min 51.5°, 45°, 4 A.M., mean hourly 61.6°
Sun Thermometer, max. 139°, 11 A.M., bright sunshine 11 1-2 hrs.
Mean dew point 53.3°, mean force vapor .6091, mean humidity 69.7.
Wind, W., total movement, 73 m., mean hourly velocity 3 m., max. pressure, 1-2 lb.=10 m. per hour, 4-30 P.M. Ozone 40.

2 Barometer reduced to sea level, max. 30.295, min. 30.18, mean 30.232.
Temperature, max. 78°, 79°, 5 P.M., min. 47.5°, 42°, 5 AM, mean hourly 64.3°.
Sun Thermometer, max. 131°, 10 A.M., bright sunshine 13 1-4 hrs.
Mean dew point 54°, mean force vapor .6704, mean humidity 68.
Wind, W., total movement 69 m., mean hourly vel. 2.9 m., max. pressure 1 1-2 lbs.= 17 m. per hour, 2-30 P.M. Ozone 40.

3 Barometer reduced to sea level, max. 30.25, min. 30.195, mean 30.228.
Temperature, max. 75.5°, 79°, 5 P.M., min. 51°, 41.5°, 6 A.M., mean hourly 63.5°.
Sun Thermometer, max. 130°, 11 A.M., bright sunshine 5 hrs.
Mean dew point 59.7°, mean force vapor .6792, mean humidity 79.
Wind, N., total movement 45 m., mean hourly vel. 1.9 m.

4. Barometer reduced to sea level, max. 30.255, min. 30.16, mean 30.207.
Temperature, max. 74°, 75.5°, 5 P.M., min. 56°, 52.5°, 6 A.M., mean hourly 64.6°

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*The first figures denote readings at top of tower, the second at base.

Sun Thermometer, max. 127°, 12-30 P.M., bright sunshine 3 hrs.
Mean dew point 62.7°, mean force vapor .6937, mean humidity 82.7.
Wind, S.W., total movement 57 m., mean hourly vel. 2.4 m., max. pressure 1-2 lb.=10 m. per hour, 3 P.M. Ozone 40.

5. Barometer reduced to sea level, max. 30.17, min. 30.07, mean 30.103.
Temperature, max. 75.5°, 78°, 12 M., min. 61°, 59.5°, 2 A.M., mean hourly 67°.
Sun Thermometer, max. 125°, 11 A.M., bright sunshine 1 hr.
Mean dew point 68°, mean force vapor .7675, mean humidity 90.7.
Wind, S. S.W., total movement 143 m., mean hourly vel. 6 m., max. pressure 1-4 lb.=7 m. per hour, 5 A.M. Several light showers of rain fell during the day beginning about 4 A. M. and ceasing about 3-30 P. M. .20 in. water fell at both top and base of tower. Ozone 70.

6. Barometer reduced to sea level, max. 30.085, min. 30.005, mean 30.045.
Temperature, max. 70°, 72°, 11 A.M., min 62°, 61°, 3 A.M., mean hourly 65°.
Sun Thermometer, max. 77°, 10 A.M., bright sunshine 0.
Mean dew point 67.3°, mean force vapor .6768, mean humidity 97.7.
Wind, N., total movement 47 m., mean hourly vel. 2 m. A steady rain began to fall about 11 A. M. and continued to fall in showers throughout the afternoon. The last shower ceased about 9 P.M. .79 in. water fell; at base of tower .89 in. Ozone 60.

7. Barometer reduced to sea level, max. 30.17, min. 30.04, mean 30.118.
Temperature, max. 79°, 80.5°, 5 P.M., min. 63°, 62 5°, 4 A.M., mean hourly 68.2°
Sun Thermometer, max. 121°, 2 P.M., bright sunshine 6 hrs.
Mean dew point 63.7°, mean force vapor .7490. mean humidity 80.7.
Wind, N. N.E., total movement 81 m., mean hourly vel. 3.4 m. Ozone 40.

8. Barometer reduced to sea level, max. 30.195, min. 30.115. mean 30.158.
Temperature. max. 75°, 78.5°, 4 P.M., min. 56°, 51.5°, 5 A.M., mean hourly 65.8°
Sun Thermometer, max. 120°, 12 M., bright sunshine 12 1-2 hrs.
Mean dew point 61°, mean force vapor .7016, mean humidity 78.3.
Wind. S.S.W., total movement 106 m., mean hourly vel. 4.4 m., max. pressure 1-2 lb.=10 m. per hour, 4 P.M. Ozone 50.

9. Barometer reduced to sea level, max. 30.27, min. 30.13, mean 30.187.
Temperature, max. 68.5°, 71°, 11 A.M., min. 57.5°, 58°, 12 P.M., mean hourly 62.9°
Sun Thermometer, max. 61°, 10 A.M., bright sunshine 0.
Mean dew point 61.7°, mean force vapor .6204, mean humidity 89.3.
Wind. N., total movement 148 m., mean hourly vel. 6.2 m., max. pressure 1 lb.=14 m. per hour, 4-15 P.M. A fine rain began to fall about 5 P.M. which later in the evening turned into a gentle rain and continued throughout the night. Ozone 50.

10. Barometer reduced to sea level. max. 30.395. min. 30.27, mean 30.367.
Temperature, max. 55.5°, 62°, 1 A.M.. min. 51.5°. 51.5°, 11 A.M.. mean hourly 53.3°
Sun Thermometer. max. 24°, 4 P.M., bright sunshine 0.
Mean dew point 53°, mean force vapor .4375. mean humidity 92.
Wind, N., total movement 137 m., mean hourly vel. 5.8 m., max. pressure 1-2 lbs.=10 m. per hour, 8-30 A.M. Rain continued to fall steadily all day until 6 P.M. when the storm ended. .70 in. water fell on the 9th and 10th; at base of tower .95 in. Ozone 60.

11. Barometer reduced to sea level, max. 30.42, min. 30.285, mean 30.362.
Temperature, max. 67°, 71°, 1 P.M., min. 52.5°, 52°, 3 A.M., mean hourly 59°.
Sun Thermometer, max. 135°, 12 M., bright sunshine 2 1-2 hrs.
Mean dew point 57°, mean force vapor .5637, mean humidity 83.3.
Wind, E., total movement 130 m., mean hourly vel. 5.4 m. A fine rain set in about 6 P.M. and continued throughout the night. Ozone 70.

12. Barometer reduced to sea level, max. 30.285, min. 30.03, mean 30.147.
Temperature, max. 71.5°, 74.5°, 3 P.M., min. 56.5°, 56°. 3 A.M.. mean hourly 64°
Sun Thermometer, max. 92°, 1-30 P.M., bright sunshine 0.
Mean dew point 65°. mean force vapor .7065. mean humidity 90.
Wind, S., total movement 94 m., mean hourly vel. 3.9 m., max. pressure 2 3-4 lbs.=23 m. per hour, 11-45 P M. The morning was misty. More or less rain fell in showers during the afternoon and evening. Ozone 50.

13. Barometer reduced to sea level, max. 30.03. min. 29.875, mean 29.902.
Temperature, max. 74°. 77.5°. 12 M.. min. 68°. 67.5°. 12 P.M., mean hourly 70.2°

Sun Thermometer, max. 72°, 10-30 A.M., bright sunshine 0.
Mean dew point 70.3°, mean force vapor .8105, mean humidity 90.7.
Wind, S.W., total movement 281 m., mean hourly vel. 11.7 m., max. pressure 5 lbs.=32 m. per hour, 11-30 A.M. A small amount of rain fell in the early morning. A thunder shower occurred between 1 P.M. and 2 P.M. Showers of rain fell during the afternoon and evening. Rain ceased falling about 12 P.M. On the 11th, 12th and 13th .95 in. water fell: at base of tower 1.25 in. Ozone 40.

14. Barometer reduced to sea level, max. 30.17, min. 29.93, mean 30.10.
Temperature, max. 26°, 72°, 4 P.M., min. 57.5°, 56.5°, 10 P.M., mean hourly 60.5°
Sun Thermometer, max. 103°, 9-30 A.M., bright sunshine 3 hrs.
Mean dew point 55.3°, mean force vapor .5425, mean humidity 80.3.
Wind, N. N.E., total movement 137 m., mean hourly vel. 5.7 m., max. pressure 1.1 lbs.=15 m. per hour, 12-30 A.M. Light showers of rain fell at 3 P.M. and 8-30 P.M. Only a trace of water fell. Ozone 80.

15. Barometer reduced to sea level, max. 30.145, min. 30.085, mean 30.105.
Temperature, max. 63.5°, 72.5°, 5 P.M., min. 57.5°, 55 5°, 1 A.M., mean hourly 60.6°.
Sun Thermometer, max. 65°, 11-30 A.M., bright sunshine 0.
Mean dew point 61.3°, mean force vapor .6067, mean humidity 90.7.
Wind, S., total movement 32 m., mean hourly vel. 1.3 m., max. pressure 1-5 lb.=6 m. per hour, 7.30 A.M. Rain began to fall about 2 A. M. and fell almost continuously until 6 P. M. when the storm ceased. .52 in. water fell: at base of nower .55 in. Ozone 40.

16. Barometer reduced to sea level, max. 30.085, min. 29.90, mean 29.955.
Temperature, max. 73.5°, 76.5°, 1 P.M., min. 63.5°, 62°, 1 A.M., mean hourly 67°.
Sun Thermometer, max. 127°, 12 M., bright sunshine 2 hrs.
Mean dew point 66.7°, mean force vapor .7552, mean humidity 86.
Wind, S. W., total movement 84 m., mean hourly vel. 3.5 m., max. pressure 1-5 lb.=6 m. per hour, 7-30 A.M. A trace of rain fell about 6 P.M. Ozone 30.

17. Barometer reduced to sea level, max. 29.90, min. 29.73, mean 29.788.
Temperature, max. 63°, 69°, 9 A.M., min. 56.5°, 58°, 12 M., mean hourly 63.9°.
Sun Thermometer, max. 45°, 10-30 A.M., bright sunshine 0.
Mean dew point 61°, mean force vapor .5693, mean humidity 95.3.
Wind, N. N.E., total movement 201 m., mean hourly vel. 8.4 m., max. pressure 4 14 lbs.=29 m. per hour, 7 P.M. Rain began to fall about 7-30 A. M. and continued to fall all day in showers. At 7 P.M. a thunder storm occurred. Ozone 40.

18. Barometer reduced to sea level, max. 29.065, min. 29.77, mean 29.938.
Temperature, max. 71.5°, 76°, 4 P.M., min. 54.5°, 52°, 12 P.M., mean hourly 62.2°
Sun Thermometer, max. 116°, 1 P.M., bright sunshine 12 hrs.
Mean dew point 55°, mean force vapor .6150, mean humidity 73.3.
Wind, N., total movement 176 m., mean hourly vel. 7.3 m., max. pressure 2 lbs.=20 m. per hour, 9-15 A.M. The storm of the 17th ceased about 1 A. M. 1.31 in. water fell; at base of tower 1.56 in. Ozone 70.

19. Barometer reduced to sea level, max. 30.13, min. 29.905, mean 30.073.
Temperature, max. 73.5°, 76°, 5 P.M., min. 47°, 43°, 6 A.M., mean hourly 60.5°.
Sun Thermometer, max. 122°, 10-30 A.M., bright sunshine 12 1-2 hrs.
Mean dew point 55.3°, mean force vapor .5842, mean humidity 79.7.
Wind, S., total movement 95 m., mean hourly vel. 4 m., max. pressure 3-4 lb.=12 m. per hour, 1 P.M. Ozone 50.

20. Barometer reduced to sea level, max. 30.145, min. 29.96, mean 30.045.
Temperature, max. 68°, 71.5°, 12 M., min. 54.5°, 51.5°, 10 P.M., mean hourly 61.4°
Sun Thermometer, max. 125°, 11 A.M., bright sunshine 6 hrs.
Mean dew point 54.3°, mean force vapor .5853, mean humidity 74.3.
Wind, N.W., total movement 196 m., mean hourly vel. 8.2 m., max. pressure 1 3-4 lbs.=19 m. per hour, 5 P.M. A light shower occurred between 7 A.M. and 8 A.M. Only a trace of water fell; at base of tower .015. Ozone 40.

21. Barometer reduced to sea level, max. 30.22, min. 30.13, mean 30.163.
Temperature, max. 66°, 68.5°, 5 P.M., min. 48°, 45.5°, 12 P.M., mean hourly 56°.
Sun Thermometer, max. 117°, 2 P.M., bright sunshine 11 1-2 hrs.

Mean dew point 47.7°, mean force vapor .4473, mean humidity 76.3.
Wind, N.W., total movement 83 m., mean hourly vel. 3.5 m., max. pressure 1-2 lb.=10 m. per hour, 8 A.M. Ozone 60.

22. Barometer reduced to sea level, max. 30.15, min. 29.945, mean 30.028.
Temperature, max. 64°, 66.5°, 4 P.M., min., 42°,38.5°, 5 A.M., mean hourly 53.6°.
Sun Thermometer, max. 94°, 10 A.M., bright sunshine 4 hrs.
Mean dew point 51.7°, mean force vapor .4997, mean humidity 80.3.
Wind, S. S.W., total movement 43 m., mean hourly vel. 1.8 m., max. pressure 1-2 lb.=10 m. per hour, 1 P.M. Ozone 40.

23. Barometer reduced to sea level, max. 29.96, min. 29.79, mean 29.865.
Temperature, max. 68.5°, 72°, 3 P.M., min. 51°, 48°, 12 P.M., mean hourly 58.6°.
Sun Thermometer, max. 111°, 1-30 P.M., bright sunshine 9 hrs.
Mean dew point 55°, mean force vapor .5246, mean humidity 85.
Wind, W. N.W., total movement 188 m., mean hourly vel. 7.8 m, max. pressure 4 1-2 lbs.=30 m. per hour, 2-30 P.M. Ozone 40.

24. Barometer reduced to sea level, max. 30.355, min. 29.92, mean 30.162.
Temperature, max. 55°, 60°, 4 P.M., min. 39°, 37.5°, 12 P.M., mean hourly 49°.
Sun Thermometer, max. 99°, 10 A.M., bright sunshine 8 hrs.
Mean dew point 38.7°, mean force vapor .3699, mean humidity 64.7.
Wind, N., total movement 206 m., mean hourly vel. 8.6 m., max. pressure 5 lbs.=32 m. per hour, 11 A.M. Ozone 50.

25. Barometer reduced to sea level, max. 30.39, min. 30.17, mean 30.275.
Temperature, max. 58:5°, 61.5°, 5 P.M., min. 32°,28.5°, 6 A.M.. mean hourly 46.2°
Sun Thermometer, max. 111°, 12-30 P.M., bright sunshine 12 hrs.
Mean dew point 40°, mean force vapor .3706, mean humidity 71.3.
Wind, S.S.W., total movement 92 m., mean hourly vel. 3.8 m., max. pressure 1 1-2 lbs.=17 m. per hour, 3 P.M. Ozone 50.

26. Barometer reduced to sea level, max. 30.17, min. 29.895, mean 30.012.
Temperature, max. 60.5°,63°, 11 A.M..min. 45.5°,41.5°, 6 A.M., mean hourly 54.7°
Sun Thermometer, max. 67°, 10-30 A.M., bright sunshine 0.
Mean dew point 54.7°. mean force vapor .4843, mean humidity 91.
Wind, S., total movement 96 m., mean hourly vel. 4 m., max. pressure 1-4 lb.=7 m. per hour, 11 A.M. Rain began falling about 12 M. and continued to fall during the afternoon and evening. Ozone 50.

27. Barometer reduced to sea level, max. 30.21, min. 29.875, mean 30.037.
Temperature, max.62.5°,66.5°,1 P.M.,min.47.5°,48.5°,12 P.M., mean hourly 56.7°
Sun Thermometer, max. 109°, 11 A.M., bright sunshine 1 hrs.
Mean dew point 51°, mean force vapor .4778, mean humidity 80.3.
Wind, N., total movement 135 m., mean hourly vel. 5.6 m., max. pressure 1 3-4 lbs.=19 m. per hour, 8.30 P.M. The storm of the 26th ceased about 1-30 A.M. .39 in. water fell; at base of tower .43 in. Ozone 30.

28. Barometer reduced to sea level, max. 30.345, min. 30.21, mean 30.308.
Temperature, max. 58.5°, 62°, 5 P.M., min. 40.5°, 37°, 6. A.M., mean hourly 48°.
Sun Thermometer, max. 112°. 12 M., bright sunshine 12 hrs.
Mean dew point 39°, mean force vapor .3672, mean humidity 66.3.
Wind, N., total movement 202 m., mean hourly vel. 8.4 m., max. pressure 2 1-2 lbs.=22 m. per hour, 9-30 A.M. Ozone 40.

29. Barometer reduced to sea level, max. 30.40, min. 30.32, mean 30.36.
Temperature, max. 59.5°,64.5°, 4 P.M., min. 40.5°,37°, 6 A.M., mean hourly 50°.
Sun Thermometer, max. 112°, 12-30 P.M., bright sunshine 9 hrs.
Mean dew point 41.3°, mean force vapor .4083, mean humidity 67.3.
Wind, N.N.E., total movement 98 m., mean hourly vel. 4.1 m., max. pressure 3-4 lb.=12 m. per hour, 12 M. Ozone 30.

30. Barometer reduced to sea level, max. 30.345, min. 30.16, mean 30.227.
Temperature, max. 71°. 77.5°, 5 P.M., min. 37°, 32°, 6 .AM., mean hourly 50°.
Sun Thermometer, max. 123°, 1 P. M., bright sunshine 9 hrs.
Mean dew point 48.7°, mean force vapor .5066, mean humidity 73.3.
Wind, S., total movement 32 m., mean hourly vel. 1.3 m.

C. D. WARNER, Meteorologist.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

BULLETIN No. 22. OCTOBER, 1890.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.11; actual minimum reading 29.025; Mean reduced to sea level, 29.88; Monthly Range, 1.085 in.

****Air Temperature.*** In Degrees Fahrenheit. Highest, 72.5°; 78°; Lowest, 30°; 26°; Mean, 48.5°; 48.2°; Monthly Range, 42.5°, 52°; Highest Mean Daily, 62.8°, 64.8°; Lowest Mean Daily, 39.8°, 38°; Mean Maximum, 55°, 58.1°; Mean Minimum, 4 .9°, 38.3°; Mean Daily Range, 13.2, 19.8°; Greatest Daily Range, 25°; 36.5°. Least Daily Range, 2.5°; 8°.

Humidity. Mean Dew Point, 41°; Mean Force of Vapor, .3982; Mean Relative Humidity, 69 2.

Wind. Prevailing Directions, N. 20 per cent., N.W. 15 per cent., S.E. 9 per cent., S.W. 9 per cent., S. 9 per cent., other directions 38 per cent.; Total Movement, 4143 miles; Greatest Daily Movement, 380 m., 24th; Least Daily Movement, 28 m. 14th: Mean Daily Movement 132.6 miles; Mean Hourly Velocity, 5.5 miles; Maximum Pressure per Square Foot, 11 lbs.=47 m. per hour, 19th, at 1 P. M.

Precipitation. In inches. Total Precipitation, 5.39 in.; at base of tower 7.13 in.

Weather. Mean Cloudiness observed, 63.9 per cent; Number of Clear Days, 6; Number of Cloudy Days, 13; Number of Fair Days, 12; Total Cloudiness recorded by the Sun Thermometer, 219 hrs., or 63 per cent. Number of days on which .01 inches or more rain fell, 14.

Bright Sunshine. Number of Hours Recorded, 129.

Mean Ozone, 33 per cent.

Halos, Solar, 2d, 16th, 27th; Lunar, 2d, 22d, 25th; Lunar corona, 1st, 25th.

Thunder and Lightning, 4th, 19th. ***Gales,*** 17th, 19th.

Frost, 13th, 22d, 23d, 31st. ***Snow,*** 19th, a trace.

Aurora, 15th, 17th.

DAILY SUMMARY.

Oct. 1 Barometer reduced to sea level, max. 30.315, min 30.21, mean 30.297.
*Temperature, max. 72.5°, 78°, 3 P.M., min 48.5°. 43°, 6 A.M., mean hourly 60.1°
Sun Thermometer, max. 125°, 12 M., bright sunshine 11 1-2 hrs.
Mean dew point 53.7°, mean force vapor .6285, mean humidity 70.7.
Wind, S.S.W., total movement, 61 m., mean hourly velocity 2.5 m., max. pressure. 1-2 lb.=10 m. per hour, 1-30 P.M. Ozone 30.

2 Barometer reduced to sea level, max. 30.34, min. 30.215, mean 30.283.
Temperature. max. 69°, 72°, 1 P.M., min. 45.5°, 40°, 7 AM, mean hourly 58.7°.
Sun Thermometer, max. 126°, 10.30 A.M., bright sunshine 6 hrs.
Mean dew point 50.3°, mean force vapor .6094, mean humidity 63.3.
Wind, S.S.W., total movement 48 m., mean hourly vel. 2 m., max. pressure 1-2 lb.= 10 m. per hour, 1-30 P.M. Ozone 10.

3 Barometer reduced to sea level, max. 30.215, min. 30.05, mean 30.072.
Temperature, max. 66.5°, 68.5°, 4 P.M., min. 53°. 50°, 6 A.M., mean hourly 60.1°.
Sun Thermometer, max. 58°, 12 M., bright sunshine 0.
Mean dew point 58.7°, mean force vapor .6127, mean humidity 82.7.
Wind, N.N.E., total movement 43 m., mean hourly vel. 1.8 m., max. pressure 3-4 lb.=12 m. per hour, 11 A.M. Ozone 20.

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*The first figures denote readings at top of tower, the second at base.

4. Barometer reduced to sea level, max. 30.05, min. 29.71, mean 29.788.
Temperature, max. 70.5°, 74 5°, 2 P.M., min. 57°, 55°, 12 P.M., mean hourly 62.8°
Sun Thermometer, max. 123°, 10 A.M., bright sunshine 7 hrs.
Mean dew point 58°, mean force vapor .6624, mean humidity 75.3.
Wind, N.W., total movement 88 m., mean hourly vel. 3.7 m., max. pressure 1 lb.=14 m. per hour, 1-30 P.M. Rain began falling about 0 A.M. and ceased about 4-30 A.M. .48 in. water fell; at base of tower .51 in. Ozone 20.

5. Barometer reduced to sea level, max. 29.815, min. 29.685, mean 29.722.
Temperature, max. 66.5°,71°,2 P.M., min. 49.5°,47.5°, 12P.M., mean hourly 59.2°
Sun Thermometer, max. 114°, 1 P.M., bright sunshine 10 hrs.
Mean dew point 52.7°, mean force vapor .5756, mean humidity 71.
Wind. W., total movement 109 m., mean hourly vel. 4.5 m., max. pressure 2 1-2 lbs.=22 m. per hour, 11 A.M. Ozone 30.

6. Barometer reduced to sea level, max. 29.855, min. 29.77, mean 29.81.
Temperature, max. 59.5°, 59.5°, 2 P.M., min 46°, 41°, 4 A.M., mean hourly 52.2.°
Sun Thermometer, max. 114°. 10-30 A.M., bright sunshine 1 hr.
Mean dew point 46°, mean force vapor .4709, mean humidity 67.3.
Wind, E.S.E., total movement 34 m., mean hourly vel. 1.4 m., max· pressure 3-4 lb.=12 m. per hour, 6-30 P.M. Ozone 40.

7. Barometer reduced to sea level, max. 29.965, min. 29.84, mean 29.938.
Temperature, max. 49°, 52.5°, 1 A.M., min. 43°, 41.5°, 9 A.M., mean hourly 45.3°
Sun Thermometer, max. 15°, 2 P.M., bright sunshine 0.
Mean dew point 42°, mean force vapor .3400, mean humidity 79.
Wind, E., total movement 124 m., mean hourly vel. 5.2 m., max. pressure 8-4 lb.=12 m. per hour, 1-30 P.M. Rain began falling about 0 A.M. and continued falling at intervals during the rest of the day. Ozone 50.

8. Barometer reduced to sea level, max. 30.22, min. 29.92, mean 30.07.
Temperature.max. 53.5°,56.5°, 3P M., min.42.5°,40.5°, 1A.M., mean hourly 47.7°
Sun Thermometer, max. 87°, 10-30 M., bright sunshine 1 hr.
Mean dew point 43°, mean force vapor .3781, mean humidity 74.7.
Wind. N.W., total movement 86 m., mean hourly vel. 3.6 m., max. pressure 1 lb.=14 m. per hour, 1-30 P.M. The storm of the 7th ceased about 3-30 A.M. .45 in. water fell; at base of tower .52 in. Ozone 50.

9. Barometer reduced to sea level, max. 30.32, min. 30.22, mean 30.28.
Temperature, max. 56°, 61°, 2 P.M., min. 42.5°, 38°, 6 A.M., mean hourly 48.9°
Sun Thermometer, max. 113°. 12 M., bright sunshine 6 hrs.
Mean dew point 42.7°, mean force vapor .3912, mean humidity 72.
Wind, N.W., total movement 74 m., mean hourly vel. 3.1 m., max. pressure 1-2 lb.=10 m. per hour, 12-30 P.M. Ozone 10.

10. Barometer reduced to sea level, max. 30.295, min. 29.89, mean 30.083.
Temperature, max. 60°, 62°, 2 P.M.. min. 37°, 33°, 6 A.M., mean hourly 50.7°
Sun Thermometer, max. 104°, 11 A.M., bright sunshine 3 hrs.
Mean dew point 47.3°, mean force vapor .4688, mean humidity 74.7.
Wind, S.S.W., total movement 99 m., mean hourly vel. 4.1 m., max. pressure 2 lbs.=20 m. per hour, 3-15 P.M. Rain began falling lightly about 4 P.M. and ceased about 8-30 P.M. .02 in. water fell; at base of tower .04 in. Ozone 30.

11. Barometer reduced to sea level, max. 29.92, min. 29.86, mean 29.895.
Temperature, max. 59.5°,61.5°, 11 A.M., min. 46°,47°, 12 P.M., mean hourly 54.3°
Sun Thermometer, max. 95°, 10 A.M., bright sunshine 4 hrs.
Mean dew point 42.3°, mean force vapor .4259, mean humidity 66.3.
Wind, W., total movement 144 m., mean hourly vel. 6 m., max. pressure 2 1-2 lbs.=22 m. per hour, 10 A.M. Ozone 40.

12. Barometer reduced to sea level, max. 29.985, min. 29.875, mean 29.925.
Temperature, max. 55°, 59°, 3 P.M., min. 40.5°, 33.5°. 7 A.M., mean hourly 46.6°
Sun Thermometer, max. 107°, 1 P.M., bright sunshine 5 hrs.
Mean dew point 35.3°, mean force vapor .3538, mean humidity 60.3.
Wind, N.E., total movement 98 m., mean hourly vel. 4.1 m., max. pressure 1 1-4 lbs.=17 m. per hour, 4 P.M. Ozone 20.

13. Barometer reduced to sea level. max. 30.06, min. 29.965, mean 30.01
Temperature, max. 58°, 64°, 4 P.M., min. 33°, 27.5°, 7 A.M., mean hourly 44.8.°
Sun Thermometer, max. 114°, 1-30 P.M., bright sunshine 11 hrs.
Mean dew point 36.3°, mean force vapor .3381, mean humidity 67.3.
Wind, N.. total movement 48 m., mean hourly vel. 2 m., max. pressure 1-4 lb. =7 m. per hour, 9 A.M. Ozone 40.

14. Barometer reduced to sea level, max. 29.965, min. 29.71, mean 29.782.
Temperature, max. 48.5°, 50°, 2 P.M., min. 39.5°, 35°, 2 A.M., mean hourly 44.6°
Sun Thermometer, max. 25°, 12-30 P.M., bright sunshine 0.
Mean dew point 44.7°, mean force vapor .3643, mean humidity 81.7.
Wind, S.S.W., total movement 28 m., mean hourly vel. 1.2 m., max. pressure 0. Rain began falling about 6 A.M. It continued falling at intervals during the day and ceased about 10 P.M. .40 in. water fell; at base of tower .43 in. Ozone 10.

15. Barometer reduced to sea level, max. 30.08, min. 29.725, mean 29.939.
Temperature, max. 58°, 59.5°, 4 P.M., min. 45°, 44 5°, 12 P.M., mean hourly 50.6°
Sun Thermometer, max. 99°, 10 A.M., bright sunshine 2 hrs.
Mean dew point 40.7°, mean force vapor .4064, mean humidity 63.7.
Wind, N.W., total movement 138 m., mean hourly vel. 5.8 m., max. pressure 4 1-4 lbs.=29 m. per hour, 11.45 A.M. Ozone 30.

16. Barometer reduced to sea level, max. 30.145, min. 29.86, mean 30.047.
Temperature, max. 64°, 66°, 2 P.M., min. 40°, 33.5°, 7 A.M., mean hourly 52.8°
Sun Thermometer, max. 103°, 9-30 A.M., bright sunshine 6 hrs.
Mean dew point 43.3°, mean force vapor .4771, mean humidity 65.
Wind, S., total movement 141 m., mean hourly vel. 5.9 m., max. pressure 2 1-4 lbs.=21 m. per hour, 1 P.M. Rain falling about 8-30 P.M. and during the night fell heavily. Ozone 30.

17. Barometer reduced to sea level, max. 29.86, min. 29.465, mean 29.58.
Temperature, max. 59°, 61.5°, 3 P.M., min. 49°, 47°, 11 P.M., mean hourly 53.4°
Sun Thermometer, max. 94°, 2-30 P.M., bright sunshine 3 hrs.
Mean dew point 43.3°, mean force vapor .4404, mean humidity 66.3.
Wind, N.W., total movement 292 m., mean hourly vel. 12.2 m., max. pressure 8 lbs.=40 m. per hour, 2-30 P.M. The storm of the 16th ceased about 11 A.M. 1.33 in. water fell; at base of tower 1.70 in. Ozone 60.

18. Barometer reduced to sea level, max. 29.945, min. 29.745, mean 29.905.
Temperature, max. 60°, 63.5°, 3 P.M., min. 43.5, 39.5°, 12 P.M mean hourly 52.3°
Sun Thermometer, max, 117°, 11-30 A.M., bright sunshine 8 hrs.
Mean dew point, 42.3°, mean force vapor .4163, men humidity 67.7.
Wind, N.W., total movement 115 m., mean hourly vel. 4.8 m., max. pressure 1 1-2 lbs.=17 m. per hour, 1-30 A.M. Ozone 40.

19. Barometer reduced to sea level, max. 29.89, min. 29.425, mean 29.583.
Temperature, max. 50.5°, 52.6°, 12 M., min. 41°, 38°, 3 A.M., mean hourly 46.7°.
Sun Thermometer, max. 34°, 1-30 P.M., bright sunshine 0.
Mean dew point 43.3°, mean force vapor .3635, mean humidity 77.3.
Wind, E., total movement 277 m., mean hourly vel. 11.5 m., max. pressure 11 lbs.=47 m. per hour, 1 P.M. Rain began falling lightly about 8-30 A.M. and continued falling through the day at intervals. In latter part of the forenoon the fall was very heavy. In the early part of the evening a trace of snow fell. Ozone 10.

20. Barometer reduced to sea level, max. 29.885, min. 29.46, mean 29.713.
Temperature, max. 46°, 50°, 1 A.M., min. 42°, 40.5°, 5 A.M., mean hourly 44.2.°
Sun Thermometer, max. 34°, 9.30 A.M., bright sunshine 0.
Mean dew point 40.3°, mean force vapor .3108, mean humidity 79.7.
Wind, N., total movement 289 m., mean hourly vel. 12 m., max. pressure 4 3-4 lbs.=31 m. per hour, 3 A.M. The day was misty. The storm of the 19th ceased about 10-30 P. M. .54 in. water fell; at base of tower .86 in. Ozone 70.

21. Barometer reduced to sea level, max. 30.24, min. 29.885, mean 30.077.
Temperature, max. 51°, 55°, 2 P.M., min. 30°, 35.5°, 12 P.M., mean hourly 44.7°.
Sun Thermometer, max. 93°, 1 P.M., bright sunshine 9 hrs.
Mean dew point 31.7°, mean force vapor .3183, mean humidity 57.3.
Wind, N.N.E., total movement 171 m., mean hourly vel. 7.1 m., max. pressure 2 1-2 lbs.=22 m. per hour, 11-30 A.M. Ozone 50.

22. Barometer reduced to sea level. max. 30.40, min. 30.24, mean 30.355.
Temperature, max. 51.5°, 56.5°, 4 P.M., min., 30°, 26°, 6 A.M., mean hourly 40.2°
Sun Thermometer, max. 110°, 1 P.M., bright sunshine 11 hrs.
Mean dew point 30.7°, mean force vapor .2810, mean humidity 64.
Wind, S.W., total movement 44 m., mean hourly vel. 1.8 m., max. pressure 1-10 lb.=5 m. per hour, 1 P.M. Ozone 50.

23. Barometer reduced to sea level, max. 30.41, min. 30.10, mean 30.267.
Temperature, max. 45°, 46.5°, 3 P.M., min. 33°, 29.5°, 5 A.M., mean hourly 39.8°
Sun Thermometer, max. 30°, 1 P.M., bright sunshine 0.
Mean dew point 32.7°, mean force vapor .2959, mean humidity 62.7.
Wind, E.N.E., total movement 100 m., mean hourly vel. 4.2 m, max. pressure 1 lb.=14 m. per hour. 5 P.M. A light rain began falling about 9 P. M. and continued falling throughout the night. Ozone 10.

24. Barometer reduced to sea level, max. 30.10, min. 29.74, mean 29.825.
Temperature, max.45.5°,47.5°, 2 P.M., min.40°,39.5°, 12 P.M., mean hourly 43.1°
Sun Thermometer, max. 14°, 12 A.M., bright sunshine 0.
Mean dew point 41.3°, mean force vapor .2955, mean humidity 87.3.
Wind, N., total movement 380 m., mean hourly vel. 15.8 m., max. pressure 5 1-2 lbs.=33 m. per hour, 8-30 A. M. Rain fell steadily nearly all day. Ozone 70.

25. Barometer reduced to sea level, max. 29.77, min. 29.675, mean 29.713.
Temperature, max. 53.5°, 55°, 3 P.M., min. 50°, 38°, 1 A.M., mean hourly 44.6°.
Sun Thermometer, max. 93°, 10-30 A.M., bright sunshine 4 hrs.
Mean dew point 33.7°, mean force vapor .3344, mean humidity 60.3.
Wind, N.E., total movement 257 m., mean hourly vel. 10.7 m., max. pressure 3 lbs.= 24 m. per hour, 1 A.M. The storm of the 23d and 24th ceased about 1-30 A.M. 1.84 in. water fell; at base of tower 2.68 in. Ozone 70.

26. Barometer reduced to sea level, max. 29.69, min. 29.56, mean 29.608.
Temperature, max. 50°, 52.5°, 3 P.M., min. 38.5°, 34°, 7 A.M., mean hourly 44.°
Sun Thermometer, max. 50°, 12 M., bright sunshine 5 hrs.
Mean dew point 31.3°, mean force vapor .3266, mean humidity 56.3.
Wind, N., total movement 86 m., mean hourly vel. 3.6 m., max. pressure 3-4 lb.=12 m. per hour, 12 M. Ozone 50.

27. Barometer reduced to sea level, max. 29.56, min. 29.315, mean 29.398.
Temperature, max. 51°, 55.5°, 1 P.M., min. 40°, 36.5°, 6 A.M., mean hourly 44.9°
Sun Thermometer, max. 84°, 1 P.M., bright sunshine 5 hrs.
Mean dew point 31.3°, mean force vapor .3256, mean humidity 56.3.
Wind, N., total movement 282 m., mean hourly vel. 11.8 m., max. pressure 4 3-4 lbs.=31 m. per hour, 6.30 P.M. A trace of rain fell about 7 P. M. Ozone 40.

28. Barometer reduced to sea level, max. 29.51, min. 29.42, mean 29.47.
Temperature, max. 42.5°, 44.5°, 1 P.M., min. 40°, 34.5°, 3 A.M., mean hourly 41.1°
Sun Thermometer, max. 26°, 12-20 M., bright sunshine 0.
Mean dew point 28.7°, mean force vapor .2732, mean humidity 58.7.
Wind, W.N.W., total movement 200 m., mean hourly vel. 8.3 m., max. pressure 5 1-2 lbs.=33 m. per hour, 12-30 P.M. Ozone 10.

29. Barometer reduced to sea level, max. 29.51. min. 29.34, mean 29.423.
Temperature, max. 41.5°, 44°, 3 P.M., min. 39°, 35.5°, 10 P.M., mean hourly 40.1°
Sun Thermometer, max. 16°, 9 A.M., bright sunshine 0.
Mean dew point 37.7°, mean force vapor .2767, mean humidity 81.
Wind, N., total movement 105 m., mean hourly vel. 4.4 m., max. pressure 1-2 lb.=10 m. per hour, 3 A.M. A small quantity of rain fell during the latter part of the night. Rain began falling again about 9-30 A.M. and continued to fall at intervals the rest of the day. Ozone 10.

30. Barometer reduced to sea level, max. 29.75, min. 29.34, mean 29.56.
Temperature, max. 46°, 44.5°, 3 P.M., min. 39°, 37.5°, 1 .AM., mean hourly 42.6°.
Sun Thermometer, max. 82°, 12 M., bright sunshine 6 hrs.
Mean dew point 35°, mean force vapor .3108, mean humidity 65.3.
Wind, W.N.W., total movement 131 m., mean hourly vel. 5.5 m., max. pressure 4 1-4 lbs.=29 m. per hour, 1 P.M. The storm of the 29th ceased about 12-30 A.M. .33 in. water fell; at base of tower .39 in. Ozone 20.

31. Barometer reduced to sea level, max. 29.89, min. 29.75, mean 29.867.
Temperature, max. 48.5°, 51.5°, 3 P.M., min. 35°, 29°, 12 P.M., mean hourly 41.4°
Sun Thermometer, max. 109°, 12 M., bright sunshine 5 hrs.
Mean dew point 31.3°, mean force vapor .2721, mean humidity 68.7.
Wind, S., total movement 52 m., mean hourly vel. 2.2 m., max. pressure 1-2 lb.=10 m. per hour, 1-30 P.M. Ozone 10.

C. D. WARNER, Meteorologist.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

BULLETIN No. 23. NOVEMBER, 1890.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude. 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.06; actual minimum reading 29.08; Mean reduced to sea level, 30.007; Monthly Range, .98 in.

****Air Temperature.*** In Degrees Fahrenheit. Highest, 57°; 62.5°; Lowest, 16°; 11.5°; Mean, 38°; 37.2°; Monthly Range, 41°, 51°; Highest Mean Daily, 49.4°, 48.3°; Lowest Mean Daily, 22.1°, 21.5°; Mean Maximum, 44.4°, 47.3°; Mean Minimum, 30.8°, 26.6°; Mean Daily Range, 13.7, 20.7°; Greatest Daily Range, 25.5°; 34°. Least Daily Range, 2.5°; 7.5°.

Humidity. Mean Dew Point, 29.7°; Mean Force of Vapor, .2606; Mean Relative Humidity, 67 8.

Wind. Prevailing Directions, N. 22 per cent., S. 13 per cent., N.W. 9 per cent., S.W. 8 per cent., other directions 48 per cent.; Total Movement, 4228 miles; Greatest Daily Movement, 297 m., 20th; Least Daily Movement, 26 m. 15th: Mean Daily Movement 140.9 miles; Mean Hourly Velocity, 5.9 miles; Maximum Pressure per Square Foot, 9 1-2 lbs. =44 m. per hour, 23d, at 10-30 A. M.

Precipitation. In inches. Total Precipitation, 1.19 in.; at base of tower 1.32 in.

Weather. Mean Cloudiness observed, 47 per cent; Number of Clear Days, 10; Number of Cloudy Days, 9; Number of Fair Days, 11; Total Cloudiness recorded by the Sun Thermometer, 159 hrs., or 53 per cent. Number of days on which .01 inches or more rain fell, 7.

Bright Sunshine. Number of Hours Recorded, 143.

Snow, 11th, 22d, 23d. Total fall in inches, 1 3-8. Hail, 11th.

Mean Ozone, 28 per cent.

Halos, Solar, 4th, 7th, 15th; Lunar, 26th; Lunar corona, 22d, 23d, 24th, 26th, 27th, 28th.

Gales, 18th, 19th, 23d.

Aurora, 7th, 13th.

DAILY SUMMARY.

Nov. 1. Barometer reduced to sea level, max. 30.00, min 29.895, mean 29.947.
*Temperature, max. 47°, 49.5°, 12 M., min 33°, 26°, 5 A.M., mean hourly 40.5°
Sun Thermometer, max. 92°, 12 M., bright sunshine 2 hrs.
Mean dew point 30.7°, mean force vapor .2767, mean humidity 63.7.
Wind, S.W., total movement, 110 m., mean hourly velocity 4.6 m., max. pressure. 2 1-2 lbs.=22 m. per hour, 2-45 P.M. Ozone 10.

2. Barometer reduced to sea level, max. 29.965, min. 29.69, mean 29.798.
Temperature, max. 46°, 48°, 4 P.M., min. 40°, 37°, 5 A.M., mean hourly 43.4°.
Sun Thermometer, max. 26°, 2 P.M., bright sunshine 0.
Mean dew point 39.7°, mean force vapor .3277, mean humidity 74.7.
Wind, S.W., total movement 92 m., mean hourly vel. 3.8 m., max. pressure 3 1-4 lb.= 25 m. per hour, 1-30 A.M. Rain began falling about 2 A. M. and ceased about 8-30 A. M. .05 in. water fell; at base of tower .07 in. Ozone 50.

3 Barometer reduced to sea level, max. 29.735, min. 29.69. mean 29.718.
Temperature, max. 46°, 49°, 11 A.M., min. 33°, 29°, 12 P.M., mean hourly 40.8°.

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*The first figures denote readings at top of tower, the second at base.

Sun Thermometer, max. 91°, 10-30 A.M., bright sunshine 3 hrs.
Mean dew point 29.7°, mean force vapor .2544, mean humidity 66.7.
Wind, W., total movement 129 m., mean hourly vel. 5.4 m., max. pressure 1 1-2 lbs.=17 m. per hour, 1 P.M. Ozone 40.

4. Barometer reduced to sea level, max. 30.065, min. 29.735, mean 29.858.
Temperature, max. 41°, 44°, 2 P.M., min. 29°, 23.5°, 7 A.M., mean hourly 35.2°
Sun Thermometer, max. 92°, 1 P.M., bright sunshine 4 hrs.
Mean dew point 23.3°, mean force vapor .2237, mean humidity 58.7.
Wind, N.W., total movement 63 m., mean hourly vel. 2.6 m., max. pressure 2 lbs.=20 m. per hour, 1 P.M. Ozone 50.

5. Barometer reduced to sea level, max. 30.205, min. 30.065, mean 30.18.
Temperature, max. 49°, 52°, 2 P.M., min. 29°, 22.5°, 6 A.M., mean hourly 39.5°
Sun Thermometer, max. 88°, 1 P.M., bright sunshine 10 1-2 hrs.
Mean dew point 31.3°, mean force vapor .2998, mean humidity 64.
Wind, S.W., total movement 116 m., mean hourly vel. 4.8 m., max. pressure 3 lbs.=24 m. per hour, 4 P.M. Ozone 10.

6. Barometer reduced to sea level, max. 30.205, min. 30.18, mean 30.19.
Temperature, max. 57°, 62.5°, 3 P.M., min 40°, 34°, 8 A.M., mean hourly 47.°
Sun Thermometer, max. 101°, 1 P.M., bright sunshine 10 1-2 hrs.
Mean dew point 41°, mean force vapor .3664, mean humidity 72.7.
Wind, S.W., total movement 109 m., mean hourly vel. 4.5 m., max. pressure 1 1-4 lbs.=16 m. per hour, 1-30 A.M. Ozone 40.

7. Barometer reduced to sea level, max. 30.275, min. 30.125, mean 30.222.
Temperature, max. 56.5°, 60.5°, 5 P.M., min. 41.5°, 35.5°, 1 A.M., mean hourly 48.5°
Sun Thermometer, max. 94°, 2 P.M., bright sunshine 4 hrs.
Mean dew point 46°, mean force vapor .4186, mean humidity 75.
Wind, S S.W., total movement 61 m., mean hourly vel. 5.2 m., max. pressure 1 3-4 lbs.=19 m. per hour, 6-30 P.M. Ozone 30.

8. Barometer reduced to sea level, max. 30.28, min. 29.995, mean 30.093.
Temperature, max. 55.5°, 57.5°, 12 M., min. 40°, 38°, 12 P.M., mean hourly 49.4°
Sun Thermometer, max. 63°, 12 M., bright sunshine 0.
Mean dew point 37°, mean force vapor .3702, mean humidity 61.7.
Wind, N., total movement 209 m., mean hourly vel. 8.7 m., max. pressure 3 3-4 lbs.=27 m. per hour. 11 A.M. Ozone 40.

9. Barometer reduced to sea level, max. 30.29, min. 29.99, mean 30.203.
Temperature, max. 52.5°, 50.5°, 12 P.M., min. 38°, 35°, 7 A.M., mean hourly 41.8°
Sun Thermometer, max. 19°. 12 M., bright sunshine 0.
Mean dew point 36.7°. mean force vapor .3140, mean humidity 71 7.
Wind, S.S.E., total movement 75 m.. mean hourly vel. 3.1 m., max. pressure 1 1-4 lbs.=16 m. per hour, 11 P.M. A very light rain began falling about 2 P.M. and continued at intervals until about 12 P. M. .01 in. rain fell at both base and top of tower. Ozone 40.

10. Barometer reduced to sea level, max. 30.285, min. 29.925, mean 30.117.
Temperature, max. 55°. 58°, 6 A.M., min. 32°, 32°, 12 P.M., mean hourly 47.8°
Sun Thermometer. max. 101°, 1 P.M., bright sunshine 6 hrs.
Mean dew point 39.7°, mean force vapor .3637, mean humidity 70.3.
Wind, N., total movement 275 m., mean hourly vel. 11.5 m., max. pressure 4 lbs.=28 m. per hour, 9 A.M. Ozone 30.

11. Barometer reduced to sea level, max. 30.34, min. 30.29, mean 30.323.
Temperature, max. 33.5°, 35°, 8 P.M., min. 31°, 27.5°, 1 A.M., mean hourly 32.3°
Sun Thermometer, max. 7°, 3 P.M., bright sunshine 0.
Mean dew point 29°, mean force vapor .2087, mean humidity 76.
Wind, N., total movement 90 m., mean hourly vel. 3.8 m., max. pressure 1-2 lb.=10 m. per hour, 10 A. M. Hail began falling about 7 A. M., later in the morning the hail was changed to snow and in the latter part of the forenoon rain fell. The storm ceased about 3 P.M. Snow and hail accumulated to a depth of one inch on cool surfaces. .13 in. water fell; at base of tower .16 in. Ozone 20.

12. Barometer reduced to sea level. max. 30.34, min. 30.29, mean 30.318.
Temperature, max. 38°, 39.5°, 2 P.M., min. 27°, 24.5°, 12 P.M., mean hourly 33.4°
Sun Thermometer, max. 27°, 2 P.M., bright sunshine 0.

Mean dew point 27.3°. mean force vapor .2231, mean humidity 69.3.
Wind, N., total movement 64 m., mean hourly vel. 2.7 m., max. pressure 1-2 lbs.=10 m. per hour, 4-30 A M. Ozone 10.

13. Barometer reduced to sea level, max. 30.29, min. 30.10, mean 30.173.
Temperature, max. 47.5°, 52°, 3 P.M., min. 22°, 18°, 7 A.M., mean hourly 35.4.°
Sun Thermometer, max. 90°, 2 P.M., bright sunshine 10 hrs.
Mean dew point 30.3°, mean force vapor .2475, mean humidity 74.3.
Wind, S.S.E., total movement 65 m., mean hourly vel. 2.7 m., max. presure 1-2 lb.=10 m. per hour, 10-30 A.M. Ozone 0.

14. Barometer reduced to sea level, max. 30.19, min. 30.095, mean 30.125.
Temperature, max.53.5°,57.5°, 2P.M.. min.34.5°,27.5°, 6 A.M., mean hourly 43.2°
Sun Thermometer, max. 91°, 1 P.M., bright sunshine 10 hrs.
Mean dew point 35°, mean force vapor .3158, mean humidity 68.
Wind. S.S.E., total movement 135 m.. mean hourly vel. 5.5 m., max. pressure 2 3-4 lbs.=23 m. per hour, 10-30 A.M. Ozone 0.

15. Barometer reduced to sea level. max. 30.35, min. 30.18, mean 30.252.
Temperature, max. 45°, 45.5°, 1 P.M., min. 30°, 25°, 7 A.M., mean hourly 38.2°
Sun Thermometer. max. 46°, 10 A.M., bright sunshine 2 hrs.
Mean dew point 35.3°, mean force vapor .2567, mean humidity 82.7.
Wind, S., total movement 26 m., mean hourly vel. 1.1 m., max. pressure 1-4 lb.=7 m. per hour, 12 M. A light rain began falling about 1 P.M. and ceased about 9-30 P.M. .11 in. water fell; at base of tower .12 in. Ozone 40.

16. Barometer reduced to sea level, max. 30.33, min. 30.18, mean 30.293.
Temperature, max. 48°, 53°, 3 P.M., min. 32°, 29.5°, 12 P.M., mean hourly 42.8°.
Sun Thermometer, max. 91°, 1-30 P.M., bright sunshine 10 hrs.
Mean dew point 32.7°, mean force vapor .2935, mean humidity 64.
Wind. N., total movement 122 m., mean hourly vel. 5.1 m., max. pressure 4 lbs.=28 m. per hour, 10 A.M. Ozone 50.

17. Barometer reduced to sea level, max. 30.34, min. 29.44, mean 29.88.
Temperature, max. 41.5°, 43.5°, 12 M., min. 30.5°, 26°, 2 A.M., mean hourly 37.9°
Sun Thermometer, max. 10°, 12 M., bright sunshine 0.
Mean dew point 38°, mean force vapor .2707, mean humidity 84.
Wind, S.S.E., total movement 46 m., mean hourly vel. 1.9 m., max. pressure 0. A light but steady rain began falling about 6-30 A.M. and continued falling the rest of the day. Ozone 30.

18. Barometer reduced to sea level, max. 29.85, min. 29.37, mean 29.647.
Temperature, max. 53.5°, 56°, 4 A.M., min. 40, 34°, 12 P.M., mean hourly 45.6°
Sun Thermometer, max, 89°, 12-30 P.M., bright sunshine 8 hrs.
Mean dew point, 34.7°, mean force vapor .3116, mean humidity 65.
Wind. N.W., total movement 216 m., mean hourly vel. 9 m., max. pressure 7 3-4 lbs.=39 m. per hour, 7-30 A.M. The storm of the 17th ceased about 3 A.M. .87 in. water fell; at base of tower .94 in. Ozone 40.

19. Barometer reduced to sea level, max. 29.85, min. 29.615, mean 29.683.
Temperature, max. 49.5°, 53°, 1 P.M., min. 37°, 35°, 12 P.M., mean hourly 42.2°.
Sun Thermometer, max. 94°. 12 M., bright sunshine 3 hrs.
Mean dew point 33.3°, mean force vapor .3021, mean humidity 65.
Wind, W., total movement 224 m., mean hourly vel. 9.3 m., max. pressure 6 1-4 lbs.=35 m. per hour, 2 P. M. Light showers fell at intervals from 11 A.M. to 4 P.M. Only a trace of water fell. Ozone 20.

20. Barometer reduced to sea level, max. 29.90, min. 29.63, mean 29.765.
Temperature. max. 36.5°, 39.5°, 1 A.M., min. 31°. 28°, 9 P.M., mean hourly 33.3°
Sun Thermometer. max. 58°, 9 A.M., bright sunshine 5 hrs.
Mean dew point 22.7°, mean force vapor .1907, mean humidity 65.
Wind, S.S.W., total movement 297 m., mean hourly vel. 12.4 m., max. pressure 5 lbs.=32 m. per hour, 11 A.M. Ozone 50.

21. Barometer reduced to sea level, max. 30.06, min. 29.90, mean 30.042.
Temperature, max. 41.5°, 46°, 3 P.M., min. 28.5°, 24°, 7 A.M., mean hourly 35.1°
Sun Thermometer, max. 97°, 1 P.M., bright sunshine 10 hrs.
Mean dew point 22.7°, mean force vapor .1997, mean humidity 65.
Wind, N.N.E., total movement 143 m., mean hourly vel. 6 m., max. pressure 1 1-4 lbs.=16 m. per hour, 1 A.M. Ozone 30.

22. Barometer reduced to sea level, max. 30.025, min. 29.81, mean 29.885.
Temperature, max. 44°, 46°, 9 A.M., min., 32.5°, 30°, 12 P.M., mean hourly 37.8°
Sun Thermometer, max. 94°, 1 P.M., bright sunshine 3 hrs.
Mean dew point 26°, mean force vapor .2358, mean humidity 62.
Wind, N., total movement 278 m., mean hourly vel. 11.6 m., max. pressure 5 3-4 lb.=34 m. per hour, 1-30 P.M. Traces of snow fell between 1 P.M. and 4 P.M. Ozone 0.

23. Barometer reduced to sea level, max. 29.99, min. 29.84, mean 29.89.
Temperature, max. 33°, 35.5°, 10 A.M., min. 21.5°, 17°, 12 P.M., mean hourly 29.3°
Sun Thermometer, max. 85°, 1 P.M., bright sunshine 7 hrs.
Mean dew point 18.3°, mean force vapor .1638, mean humidity 65.
Wind, N., total movement 180 m., mean hourly vel. 7.5 m. max. pressure 9 1-2 lbs.=44 m. per hour, 10-30 A.M. Snow began falling early in the morning and ceased about 7 A.M. 1-4 in. snow fell which melted into .02 in. water. A trace of snow fell again about 12 M. Ozone 60.

24. Barometer reduced to sea level, max. 30.16, min. 29.99, mean 30.083.
Temperature, max. 36°, 36°, 3 P.M., min. 20°, 13°, 6 A.M., mean hourly 28.5°
Sun Thermometer, max. 93°, 10-30 A.M., bright sunshine 3 hrs.
Mean dew point 19.7°, mean force vapor .1859, mean humidity 62.3.
Wind, S., total movement 135 m., mean hourly vel. 5.6 m., max. pressure 2 1-2 lbs.=22 m. per hour, 7 P.M. Ozone 40.

25. Barometer reduced to sea level, max. 30.03, min. 29.69, mean 29.783.
Temperature, max. 52°, 55.5°, 2 P.M., min. 37°, 32°, 1 A.M., mean hourly 45°.
Sun Thermometer, max. 91°, 11-30 A.M., bright sunshine 5 hrs.
Mean dew point 36°, mean force vapor .3468, mean humidity 62.7.
Wind, S.W., total movement 269 m., mean hourly vel. 11.2 m., max. pressure 3 lbs.=24 m. per hour, 10 P.M. Ozone 10.

26. Barometer reduced to sea level, max. 30.05, min. 29.77, mean 29.987.
Temperature, max. 38°, 44.5°, 1 A.M., min. 25°, 23°, 12 P.M., mean hourly 31.8°
Sun Thermometer, max. 85°, 12 M., bright sunshine 3 hrs.
Mean dew point 22°, mean force vapor .1695, mean humidity 70.3.
Wind, N.N.E., total movement 187 m., mean hourly vel. 7.8 m., max. pressure 3 1-2 lbs.=26 m. per hour, 1-30 A.M. Ozone 50.

27. Barometer reduced to sea level, max. 30.06, min. 30.045, mean 30.052.
Temperature, max. 28°, 32°, 2 P.M., min. 18°, 16°, 12 P.M., mean hourly 23.9°
Sun Thermometer, max. 75°, 1 P.M., bright sunshine 9 hrs.
Mean dew point 9°, mean force vapor .1247, mean humidity 58.7.
Wind, N., total movement 164 m., mean hourly vel. 6.8 m., max. pressure 5 lbs.=32 m. per hour, 1 P.M. Ozone 10.

28. Barometer reduced to sea level, max. 30.05, min. 30.03, mean 30.042.
Temperature, max. 29°, 31.5°, 2 P.M., min. 16°, 11.5°, 3 A.M., mean hourly 22.1°
Sun Thermometer, max. 83°, 2 P.M., bright sunshine 9 3-4 hrs.
Mean dew point 10°, mean force vapor .1299, mean humidity 58.
Wind, N., total movement 155 m., mean hourly vel. 6.5 m., max. pressure 3 1-2 lbs.=26 m. per hour, 3-30 P.M. Ozone 40.

29. Barometer reduced to sea level, max. 30.03, min. 29.905, mean 29.943.
Temperature, max. 39.5°, 43°, 1 P.M., min. 23.5°, 18.5°, 1 A.M., mean hourly 33.4°
Sun Thermometer, max. 94°, 12-30 P.M., bright sunshine 1 hr.
Mean dew point 25°, mean force vapor .2124, mean humidity 65.7.
Wind, S., total movement 127 m., mean hourly vel. 5.3 m., max. pressure 1 1-2 lbs.=17 m. per hour, 2-30 P.M. Ozone 0.

30. Barometer reduced to sea level, max. 29.905, min. 29.58, mean 29.703.
Temperature, max. 40°, 42°, 2 P.M., min. 30°, 26°, 8 A.M., mean hourly 34.2°.
Sun Thermometer, max. 54°, 3 P.M., bright sunshine 3 hrs.
Mean dew point 27.3°, mean force vapor .2147, mean humidity 71.
Wind, S., total movement 66 m., mean hourly vel. 3.2 m., max. pressure 1-2 lb.=10 m. per hour, 11-30 P.M. Ozone 10.

C. D. WARNER, Meteorologist.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

BULLETIN No. 24. DECEMBER, 1890.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

MONTHLY SUMMARY.

Pressure. In inches. Actual maximum reading 30.29; actual minimum reading 29.115; Mean reduced to sea level, 30.013; Monthly Range, 1.175 in.

*****Air Temperature.*** In Degrees Fahrenheit. Highest, 42.5°; 43.5°; Lowest, 2°, —5°; Mean, 22.9°; 21.8°; Monthly Range, 40.5°, 48.5°; Highest Mean Daily, 36.3°, 36.5°; Lowest Mean Daily, 8.2°, 8.4°; Mean Maximum, 29.5°, 31°; Mean Minimum, 15 8°, 12.6°; Mean Daily Range, 13.6, 18.4°; Greatest Daily Range, 25°; 35.5°. Least Daily Range, 5°; 8°.

Humidity. Mean Dew Point, 14.7°; Mean Force of Vapor, .1400; Mean Relative Humidity, 67 2.

Wind. Prevailing Directions, N. W. 30 per cent., N. 16 per cent., S. W. 12 per cent., N.N.W. 9 per cent., other directions 33 per cent.; Total Movement. 5673 miles; Greatest Daily Movement, 325 m., 17th; Least Daily Movement, 43 m. 9th; Mean Daily Movement, 183 miles; Mean Hourly Velocity, 7.6 miles; Maximum Pressure per Square Foot, 24½ lbs.= 70 m. per hour, 4th, at 9-30 A. M.

Precipitation. In inches. Total Precipitation, 1.18 in.; at base of tower 2.86 in.

Weather. Mean Cloudiness observed, 53 per cent; Number of Clear Days, 15; Number of Cloudy Days, 11; Number of Fair Days, 5; Total Cloudiness recorded by the Sun Thermometer, 153 hrs., or 54 per cent. Number of days on which .01 inches or more rain or snow fell, 9. Depth of snow, in inches, on ground at close of month, 10 in.

Bright Sunshine. Number of Hours Recorded, 131.

Snow, 3d, 5th, 6th, 17th, 18th, 22d, 26th, 27th, 29th, 30th. Total fall in inches, 15¾. Hail, 3d, 6th, 27th. Rain, 3d, 6th, 17th, 18th, 21st, 22d.

Mean Ozone, 39 per cent.

Halos, Lunar, 16th; 25th; Lunar corona, 23d, 24th, 29th, 30th.

Gales, 2d, 4th, 7th, 12th, 17th, 18th, 19th, 22d, 24th, 28th.

DAILY SUMMARY.

DEC. 1. Barometer reduced to sea level, max. 29.725, min 29.545, mean 29.62.
*Temperature, max. 35.5°, 38°, 2 A.M., min 13.5°, 15°, 12 P.M., mean hourly 23°.
Sun Thermometer, bright sunshine 3 hrs.
Mean dew point 4.3°, mean force vapor .1123, mean humidity 49.7.
Wind, N.W., total movement, 248 m., mean hourly velocity 10.3 m., max. pressure, 4 1-2 lbs.=30 m. per hour, 7-30 A.M. Ozone 40.

2. Barometer reduced to sea level, max. 30.3, min. 29.725, mean 30.
Temperature, max. 19°, 21°, 2 P.M., min. 8°, 4°, 12 P.M., mean hourly 12.8°.
Sun Thermometer, bright sunshine 6 hrs.
Mean dew point -1.7°, mean force vapor .0818, mean humidity 54.
Wind, N.W., total movement 171 m., mean hourly vel. 7.1 m., max. pressure 6 1-4 lbs.= 35 m. per hour, 3 P.M. Ozone 20.

3 Barometer reduced to sea level, max. 30.41, min. 29.69, mean 30.168.
Temperature, max. 21°, 21°. 12 P.M., min. 5°, 2.5°, 2 A.M., mean hourly 10.5°.
Sun Thermometer, bright sunshine 0.
Mean dew point 6.3°, mean force vapor .0901, mean humidity 69.3.
Wind, N.W., total movement 125 m., mean hourly vel. 5.2 m., max. pressure 1 1-4 lbs.=16 m. per hour, 8 P.M. Snow began falling about 9 A.M. The storm continued throughout the day with hail and fine rain in the evening.

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*The first figures denote readings at top of tower, the second at base.

The storm ceased about 12 P. M. 2 in. of snow and hail fell=.66 in. water at base of tower. Ozone 40.

4. Barometer reduced to sea level, max. 30.06, min. 29.48, mean 29.778.
Temperature, max. 31°, 33.5°, 6 A.M., min. 22°, 19.5°, 1 A.M., mean hourly 26.4°
Sun Thermometer, bright sunshine 6 hrs.
Mean dew point 14°, mean force vapor .1469, mean humidity 58.3.
Wind, N.W., total movement 220 m., mean hourly vel. 9.2 m., max. pressure 24 1-2 lbs.=70 m. per hour, 9-30 A.M. Ozone 10.

5. Barometer reduced to sea level, max. 30.27. min. 30.06, mean 30.202.
Temperature, max. 30°, 29.5°, 10 A.M., min. 25°. 21°, 3 A.M., mean hourly 28.1°
Sun Thermometer, bright sunshine 0.
Mean dew point 25.7°, mean force vapor .1645, mean humidity 85.3.
Wind, S.W., total movement 129 m., mean hourly vel. 5.4 m., max. pressure 2 lbs.=20 m. per hour, 1-30 A.M. Snow began falling about 9 A. M. and ceased about 6 P. M. The snow amounted to 1 1-4 in. = .08 in. water at base of tower. Ozone 60.

6. Barometer reduced to sea level, max. 30.32, min. 29.95, mean 30.175.
Temperature, max. 30°, 30.5°, 9 P.M., min 23.5°, 21°, 8 A.M., mean hourly 26.5°
Sun Thermometer, bright sunshine 0.
Mean dew point 23.7°, mean force vapor .1684, mean humidity 81.7.
Wind, N.W., total movement 97 m., mean hourly vel. 4 m., max. pressure 3 3-4 lbs.=27 m. per hour, 2 A.M. Snow began falling about 10 A. M., which in the evening changed to rain and hail. The snow and sleet amounted to 1-4 in.=.55 in. water at base of tower. Ozone 10.

7. Barometer reduced to sea level, max. 30.285, min. 29.92, mean 30.065.
Temperature, max.33.°,35.5°, 12 P.M., min.12.5°,11.5°,4 A.M., mean hourly 25.6°
Sun Thermometer, bright sunshine 6 hrs.
Mean dew point 13.3°, mean force vapor .1345, mean humidity 66.7.
Wind, N.W., total movement 184 m., mean hourly vel. 7.7 m., max. pressure 6 1-2 lbs.=36 m. per hour, 11-30 A.M. Ozone 50.

8. Barometer reduced to sea level, max. 30.335, min. 30.125, mean 30.242.
Temperature, max. 17°, 17°. 3 P. M., min. 8°, 1.5°, 6 A.M., mean hourly 13.8°.
Sun Thermometer, bright sunshine 0.
Mean dew point 9°, mean force vapor .0884, mean humidity 77.7.
Wind, N.W., total movement 108 m., mean hourly vel. 4.5 m., max. pressure 2 lbs.=20 m. per hour, 10-30 A.M. Ozone 10.

9. Barometer reduced to sea level, max. 30.125, min. 29.80, mean 29.87.
Temperature, max. 31.5°, 34°, 2 P.M., min. 14.5°, 10°, 8 A.M., mean hourly 23.6°
Sun Thermometer, bright sunshine 7 hrs.
Mean dew point 20°, mean force vapor .1485, mean humidity 77.3.
Wind, S., total movement 43 m., mean hourly vel. 1.8 m., max. pressure 1-4 lb.=6 m. per hour, 1 P.M. Ozone 0.

10. Barometer reduced to sea level, max. 29.80, min. 29.46, mean 29.588.
Temperature, max. 33°, 34.5°, 2 P.M., min. 20°, 15°, 7 A.M., mean hourly 28.4°
Sun Thermometer, bright sunshine 0.
Mean dew point 22°. mean force vapor .1804, mean humidity 68.7.
Wind, S.S.W., total movement 99 m., mean hourly vel. 4.1 m., max. pressure 1 1-2 lbs.=17 m. per hour, 12 M. Ozone 10.

11. Barometer reduced to sea level, max. 29.62. min. 29.46, mean 29.55.
Temperature, max. 39°, 43.5°, 2 P.M., min. 32°, 29.5°, 1 A.M., mean hourly 36.3°
Sun Thermometer, bright sunshine 2 hr.
Mean dew point 27.7°, mean force vapor .2461, mean humidity 63.
Wind, W., total movement 123 m., mean hourly vel. 5.1 m., max. pressure 2 3-4 lbs.=23 m. per hour, 11 A. M. Ozone 0.

12. Barometer reduced to sea level, max. 30.02, min. 29.48, mean 29.722.
Temperature, max. 34°, 35.5°. 1 A.M., min. 9°, 6.5°. 12 P.M., mean hourly 23.2°
Sun Thermometer, bright sunshine 7 hrs.
Mean dew point 10.7°, mean force vapor .1174, mean humidity 66.3.
Wind, N.W., total movement 247 m., mean hourly vel. 10.2 m., max. pressure 7 lbs.=37 m. per hour, 2 P.M. Ozone 20.

13. Barometer reduced to sea level, max. 30.26, min. 30.02, mean 30.16.
Temperature, max. 25°, 25°, 3 P.M., min. 6°, 3°, 8 A.M., mean hourly 16.5.°
Sun Thermometer, bright sunshine 8 1-2 hrs.

Mean dew point 2.7°, mean force vapor .1037, mean humidity 58.
Wind, S.W., total movement 187 m., mean hourly vel. 7.8 m., max. pressure 4 lbs.=28 m. per hour, 5-30 A.M. Ozone 40.

14. Barometer reduced to sea level, max. 30.165, min. 29.935, mean 29.988.
Temperature, max. 40.5°, 41.5°, 3 P.M., min. 24°, 20°, 1 A.M., mean hourly 33.3°
Sun Thermometer, bright sunshine 8 hrs.
Mean dew point 20.3°, mean force vapor .2116, mean humidity 55.
Wind, S.W., total movement 228 m., mean hourly vel. 9.5 m., max. pressure 3 1-4 lbs.=25 m. per hour, 4-30 A.M. Ozone 30.

15. Barometer reduced to sea level, max. 30.41, min. 30.025, mean 30.23.
Temperature, max. 37°, 39.5°, 1 P.M., min. 23°, 22.5°, 12 P.M., mean hourly 31.5°
Sun Thermometer, bright sunshine 7 hrs.
Mean dew point 22°, mean force vapor .1742, mean humidity 72.
Wind, N., total movement 132 m., mean hourly vel. 5.5 m., max. pressure 3 lbs.=24 m. per hour, 12-30 P.M. Ozone 40.

16. Barometer reduced to sea level, max. 30.55, min. 30.41, mean 30.50.
Temperature, max. 30°, 29.5°, 3 P.M., min. 15°, 11.5°, 7 A.M., mean hourly 23°.
Sun Thermometer, bright sunshine 4 hrs.
Mean dew point 16.7°, mean force vapor .1323, mean humidity 73.7.
Wind, N., total movement 178 m., mean hourly vel. 7.4 m., max. pressure 1 lb.=14 m. per hour, 4 P.M. Ozone 30.

17. Barometer reduced to sea level, max. 30.43, min. 29.63, mean 30.017.
Temperature, max. 33.5°, 36°, 3 P.M., min. 26°, 24°, 1 A.M., mean hourly 30.2°.
Sun Thermometer, bright sunshine 0.
Mean dew point 26.7°, mean force vapor .1831, mean humidity 80.
Wind, N., total movement 325 m., mean hourly vel. 13.5 m., max. pressure 13 lbs.=51 m. per hour, 5 P. M., Snow and rain fell at intervals during the day beginning about 7 A. M. Ozone 20.

18. Barometer reduced to sea level, max. 29.71, min. 29.455, mean 29.555
Temperature, max. 36°, 38.5°, 3 P.M., min. 27.5°, 25.5°, 8 P.M., mean hourly 32.2°
Sun Thermometer, bright sunshine 2 hrs.
Mean dew point, 24.3°, mean force vapor .1938, mean humidity 69.
Wind, N.W., total movement 312 m., mean hourly vel. 13 m., max. pressure 8 lbs.=40 m. per hour, 0 A.M. The storm of the 17th ceased in the early part of the forenoon. About 1 in. of snow fell=.65 in. water at base of tower. Ozone 70.

19. Barometer reduced to sea level, max. 30.395, min. 29.71, mean 30.13.
Temperature, max. 26.5°, 31°, 1 A.M., min. 12°, 9°, 12 P.M., mean hourly 16.5°.
Sun Thermometer, bright sunshine 9 hrs.
Mean dew point —1.3°, mean force vapor .0865, mean humidity 49.7.
Wind, N.W., total movement 318 m., mean hourly vel. 13.3 m., max. pressure 9 lbs.=43 m. per hour, 1-30 P. M. Ozone 50.

20. Barometer reduced to sea level, max. 30.595, min. 30.365, mean 30.478.
Temperature, max. 26°, 30°, 11 P.M., min. 8.5°, 4°, 7 A.M., mean hourly 17.9°
Sun Thermometer, bright sunshine 9 hrs.
Mean dew point 2.7°, mean force vapor .1147, mean humidity 54.7.
Wind, S.S.W., total movement 87 m., mean hourly vel. 3.6 m., max. pressure 1 lb.=14 m. per hour, 9 P.M. Ozone 10.

21. Barometer reduced to sea level, max. 30.365, min. 29.79, mean 30.003.
Temperature, max. 37°, 37°, 12 P.M., min. 26°, 21°, 1 A.M., mean hourly 32.8°
Sun Thermometer, bright sunshine 0.
Mean dew point 30.3°, mean force vapor .2180, mean humidity 78.7.
Wind, S.S.W., total movement 235 m., mean hourly vel. 9.8 m., max. pressure 2 3-4 lbs.=23 m. per hour, 5-30 P.M. A drizzling rain began about 12 M. and continued falling the rest of the day. Ozone 20.

22. Barometer reduced to sea level, max. 30.01, min. 29.79, mean 29.933.
Temperature, max. 40.5°, 42°, 3 A.M., min., 30°, 27°, 10 P.M., mean hourly 35.7°
Sun Thermometer, bright sunshine 8 hrs.
Mean dew point 22.7°, mean force vapor .2044, mean humidity 60.
Wind, N.W., total movement 253 m., mean hourly vel. 10.5 m., max. pressure 7 lbs.=37 m. per hour, 10 A.M. The storm of the 21st ceased about 7-30 A. M. with a trace of snow at that time, .01 in. water fell; at base of tower .03 in. Ozone 70.

23. Barometer reduced to sea level, max. 30.01, min. 29.725, mean 29.827.
Temperature, max. 42.5°, 43°, 1 P.M., min. 29°.24.5°, 3 A.M., mean hourly 35.8°
Sun Thermometer, bright sunshine 2 hrs.
Mean dew point 28.3°, mean force vapor .2364, mean humidity 67.
Wind, S.W., total movement 152 m., mean hourly vel. 6.3 m. max. pressure 4 lbs.=28 m. per hour, 10 P. M. Ozone 80.

24. Barometer reduced to sea level, max. 30.195, min. 29.73, mean 30.02.
Temperature. max. 31°, 33°, 1 A.M., min. 21°, 12°, 8 P.M., mean hourly 23.7°
Sun Thermometer. bright sunshine 8 hrs.
Mean dew point 10.7°, mean force vapor .1262, mean humidity 57.3.
Wind, N.W., total movement 302 m., mean hourly vel. 12.5 m., max. pressure 10 1-2 lbs.=46 m. per hour, 7 A. M. Ozone 70.

25. Barometer reduced to sea level, max. 30.59, min. 30.195, mean 30.442.
Temperature, max. 22°, 17°, 1 A.M., min. 8.5°, 7°, 12 P.M., mean hourly 15.4°.
Sun Thermometer, bright sunshine 9 hrs.
Mean dew point 4.3°, mean force vapor .0841, mean humidity 66.
Wind, N.W., total movement 175 m., mean hourly vel. 7.3 m., max. pressure 4 1-4 lbs.=29 m. per hour, 10-30 A.M. Ozone 80.

26. Barometer reduced to sea level. max. 30.59, min. 29.70, mean 30.287.
Temperature, max. 19.5°, 20°, 12 P.M., min. 5°, 8°, 3 A.M., mean hourly 10.4°
Sun Thermometer, bright sunshine 0.
Mean dew point 4.3°, mean force vapor .0729, mean humidity 77.7.
Wind, N., total movement 203 m., mean hourly vel. 8.5 m., max. pressure 4 1-4 lbs.=29 m. per hour, 8 P.M. Snow began falling about 8 A.M. and continued throughout the day accumulating very fast. Ozone 10.

27. Barometer reduced to sea level, max. 29.70, min. 29.415, mean 29.43.
Temperature, max. 29.5°, 30.5°, 3 P.M., min. 20°, 22.5°, 1 A.M., mean hourly 26°.
Sun Thermometer, bright sunshine 2 hrs.
Mean dew point 23.7°, mean force vapor .1662, mean humidity 79.
Wind, S.W., total movement 263 m., mean hourly vel. 11 m., max. pressure 5 1-2 lbs.=33 m. per hour, 2 A.M. The storm of the 26th ceased in the very early part of the morning; 11 in. of snow fell=.88 in. water at base of tower. Ozone 80.

28. Barometer reduced to sea level, max. 29.975, min. 29.425, mean 29.777.
Temperature, max. 25°, 27.5°, 1 A.M., min. 2°, —3.5°, 8 P.M., mean hourly 13.4°
Sun Thermometer, bright sunshine 9 hrs.
Mean dew point 1°, mean force vapor .0740, mean humidity 69.
Wind, N.W., total movement 234 m., mean hourly vel. 9.8 m., max. pressure 6 3-4 lbs.=37 m. per hour, 10 A.M. Ozone 70.

29. Barometer reduced to sea level, max. 30.05, min. 29.795, mean 29.877.
Temperature, max. 27°, 30.5°, 3 P.M., min. 4°, —5°, 1 A.M., mean hourly 16.4°
Sun Thermometer, bright sunshine 6 hrs.
Mean dew point 7.3°, mean force vapor .1105, mean humidity 62.
Wind, S., total movement 157 m., mean hourly vel. 6.5 m., max. pressure 3 lbs.=24 m. per hour, 8-30 P. M. A trace of snow fell about 8 A. M. Ozone 50.

30. Barometer reduced to sea level, max. 30.445, min. 30.05, mean 30.407.
Temperature, max. 15°, 21.5°, 1 A.M., min. 2°, —5°, 8 A.M., mean hourly 8.4°.
Sun Thermometer, bright sunshine 2 hrs.
Mean dew point 2.7°, mean force vapor .0706, mean humidity 73.3
Wind, N., total movement 68 m., mean hourly vel. 2.8 m., max. pressure 1 1-2 lbs.=17 m. per hour, 0 A.M. Snow began falling about noon and continued falling the rest of the day. 1-4 of an inch fell=.01 in. water. Ozone 70.

31. Barometer reduced to sea level, max. 30.43, min. 30.305, mean 30.352·
Temperature, max. 15.5°, 15.5°, 10 P.M., min.8°, 5°, 1 A.M., mean hourly 11.8°
Sun Thermometer, bright sunshine 0.
Mean dew point 6.3°, mean force vapor .0965, mean hmidity 63.7.
Wind, N., total movement 70 m., mean hourly vel. 2.9 m., max. pressure 1-2 lb.=10 m. per hour, 7 A.M. Ozone 60.

C. D. WARNER, Meteorologist.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 25. JANUARY, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.315, 16th, 10 P.
Actual minimum reading,	28.40, 12th, 6 A.
Mean reduced to sea level,	29.958
Monthly range,	1.915

**Air Temperature.* In Degrees Fahr.

Highest,	50.5; 52.
Lowest,	6.;—0.5
Mean,	27.6; 26.4
Monthly Range,	44.5; 52.5
Highest mean daily,	41.7; 41.8
Lowest mean daily,	14.3; 10.5
Mean maximum,	33.6; 36
Mean minimum,	21.3; 16.8
Mean daily range,	12.3; 19.2
Greatest daily range,	29.5; 36.
Least daily range,	4; 7.5

Humidity.

Mean dew point,	20.7
Mean force of vapor,	.1707
Mean relative humidity,	72.2

Wind.

Prevailing Directions.

North,	31 per cent.
North West,	15 " "
South South West,	14 " "
South,	12 " "
Other directions,	28 " "
Total movement,	4954 m.
Greatest daily movement,	345 m., 18th
Least daily movement,	3 m., 1st
Mean daily movement,	159.8 m.
Mean hourly velocity,	6.7 m.
Maximum pressure per square foot,	16¼ lbs.= 57 m. per hour, 22d, at 3 P. M.

**Precipitation.* In inches.

Total precipitation,	4.75; 6.75

Weather.

Mean cloudiness observed,	61 per cent.
Number of clear days,	11
Number of cloudy days,	13
Number of fair days,	7
Total cloudiness recorded by the Sun Thermometer,	172 hours or 58 per cent.
Number of days on which .01 inch or more rain or snow fell,	13
Depth of snow, in inches, on ground at close of month,	6

Bright Sunshine.

Number of Hours recorded,	126½

Snow, 1st, 5th, 6th, 14th, 17th, 18th, 25th, 27th, 29th, 31st.

Total Fall in inches,	17¾

Rain, 1st. 2d, 11th, 12th, 17th, 18th, 21st, 22d, 23d, 29th, 31st.

Hail,	17th, 18th.
Thunder and ***Lightning***,	2d.
Mean Ozone,	48 per cent.

Halos.

Solar,	4th, 31st
Lunar,	15th, 23d
Lunar coronae,	14th, 18th, 19th

Gales, of 50 or more miles per hour, 53, w., 12th; 50, n. w., 14th; 57, s. w., 22d.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
DAY.	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.305	29.87	30.098	26.	24.5	12 P	14.5	12.	6 A	18.4	50
2	29.87	29.36	29.465	33.	34.5	12 M	27.	22.5	1 A	31.6	50
3	30.18	29.38	29.908	35.	37.5	3 A	13.5	13.	12 P	25.7	50
4	30.315	30.18	30.247	20.	20.5	5 P	6.	0.5	8 A	14.3	70
5	30.17	29.925	29.967	26.5	27.5	4 P	20.	17.	1 A	23.1	60
6	29.98	29.935	29.953	24.	26.	3 P	16.5	11.	8 A	21.5	60
7	30.12	29.97	30.017	29.	31.5	2 P	21.	17.5	4 A	24.4	50
8	30.47	30.12	30.36	32.	37.5	4 P	20.	16.5	8 A	25.1	50
9	30.52	30.35	30.445	25.	31.	3 P	9.	4.	8 A	18.2	50
10	30.35	30.18	30.223	29.	35.5	5 P	6.5	-0.5	8 A	19.2	10
11	30.19	29.24	29.818	44.5	41.5	12 P	15.	9.	3 A	25.7	10
12	29.44	28.69	29.053	42.5	49.	1 A	28.	24.5	11 P	34.9	50
13	29.80	29.44	29.708	26.	32.	1 A	13.	11.	12 P	20.0	60
14	29.98	29.80	29.793	32.	33.5	10 P	13.	7.	1 A	22.2	50
15	30.39	29.98	30.312	29.5	33.	4 P	18.5	12.	8 A	25.3	40
16	30.62	30.305	30.468	27.	32.5	12 M	12.	11.	12 P	22.4	40
17	30.625	29.96	30.327	26.	27.5	9 P	10.	7.	4 A	17.7	50
18	30.04	29.83	29.907	33.	34.5	3 P	26.	24.	1 A	28.9	50
19	30.125	30.04	30.072	29.	33.5	4 P	23.	20.5	8 A	25.6	50
20	30.07	30.00	30.038	34.	39.	4 P	21.5	15.5	8 A	27.8	50
21	30.06	30 015	30.037	36.	37.5	2 P	25.	18.	6 A	31.4	40
22	30.015	29.315	29.568	50.5	52.	4 P	34.	31.5	2 A	41.7	40
23	30.105	29.50	29.892	42.	42.5	2 P	35.	32.	12 P	38.2	90
24	30.215	29.995	30.115	43.5	45.5	3 P	30.	23.5	8 A	36.8	40
25	29.995	29.53	29.693	35.5	36.5	3 P	27.	21.	11 P	31.9	40
26	30.02	29.94	29.98	33.	33.5	2 P	25.5	19.	8 A	29.6	60
27	30.09	30.02	30.058	38.5	44.5	2 P	25.5	19.5	3 A	32.7	40
28	30.275	30.065	30.203	41.	46.	3 P	28.5	22.	7 A	35.1	50
29	30.275	29.795	30.073	35.	34.5	10 P	31.	27.	5 A	33.6	50
30	30.02	29.695	29.782	45.	45.5	11 A	35.	31.	1 A	39.8	30
31	30.255	29.925	30.12	38.	36.5	1 P	30.	22.	7 A	34.5	50

DAILY SUMMARY.

		HUMIDITY.			WIND.					PRECIPITATION.			
												TOTAL IN INCHES.	
DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	SNOW.
1	0	16.3	.1173	82.	N.N.W.	3	0	–	–	5-30 A	12 P		
2	0	31.	.1975	89.	S.W.	27	¾	12	5 P	0 A	12 P		
3	7	12.3	.1299	62.7	N.	287	9	42	2 P	0 A	3 A	.65	¼
4	2	6.7	.0993	67.7	N.	118	3½	26	1 A				
5	0	17.	.1358	72.	N.	270	4	28	4 A	†– A			T.
6	6	11.	.1140	67.3	N.W.	156	2	20	2 P	9 P			T.
7	5	12.7	.1397	59.3	N.W.	249	6½	36	11 P				
8	9¼	11.7	.1463	54.7	N.	271	4½	30	11 A				
9	6	9.3	.1058	68.	N.	95	1¾	19	0 A				
10	9½	14.7	.1126	82.7	N.	17	½	10	10 A				
11	0	26.	.1854	82.	S.S.W.	28	¾	12	11 P	– A	12 P		
12	1	26.7	.2150	69.7	N.W.	295	14½	54	10 A	0 A	7 A	1.89	
13	8	6.7	.0971	65.	N.W.	307	12	49	2 P				
14	2	16.3	.1485	72.7	W.N.W	58	12¼	50	11 P	– A	9 P	.07	¾
15	9	12.[illegible]	.1387	58.3	S.S.W.	175	2½	22	8 P				
16	9	14.3	.1216	72.7	N.	157	1	14	1 P				
17	0	15.3	.1139	81.7	N.	241	2¼	21	12 P	8 A	12 P		
18	0	25.7	.1772	80.7	N.	345	5	32	10-30 P	0 A	1 P	1.05	3
19	5	17.7	.1433	68.3	N.	243	4½	30	12 M				
20	9¾	24.7	.1706	79.7	W.	27	0	–	–				
21	1	29.3	.2092	79.	S.	87	¾	12	3-30 P	4 P	6 P	T.	
22	0	38.3	.3071	78.	S.W.	227	16¼	57	3 P	– A	7-30 P	1.60	
23	8	23.7	.2350	57.3	W.	304	9	42	4 A				
24	8	29.	.2393	68.7	S.S.W.	77	½	10	3 P				
25	3	24.	.1904	69.7	N.	225	7	37	9 A	– A	1 P	.76	12
26	3	26.	.1732	83.7	S.W.	112	1¾	19	3 A				
27	5	30.7	.2254	77.	S.	86	½	10	8 P	– A	10 A	.05	¼
28	6	30.3	.2431	72.7	S.	36	0	–	–				
29	0	32.7	.2030	90.7	N.	14	0	–	–	– A	12 P	.64	1½
30	3	26.	.2575	55.	W.	244	9¼	43	2 P				
31	1	25.	.1976	69.3	S.S.W.	173	3¼	25	0 A	6 P	12 P	.04	T

†Early morning. T=trace.

ANNUAL SUMMARY FOR 1890.

PRESSURE.

In Inches.

Actual max. reading,	30.64, Jan. 1st, 4 A.
Actual min. reading,	29.025, Oct. 27th, 2 P.
Mean reduced to sea level,	30.03
Annual range,	1.615

AIR TEMPERATURE.

In Degrees Fahr.

Highest,	92; 94, July 8th
Lowest,	2; -6.5, March 7th
Mean,	47.7; 46.9
Annual range,	90: 100.5
Highest mean daily,	80; 81, July 31st
Lowest mean daily,	84; 83, Dec. 30th
Mean maximum,	54.3; 57.7
Mean minimum,	37.4; 35.9
Mean daily range,	16.8; 21.9
Greatest daily range,	38; 48.5, Apr. 13th
Least daily range,	2 Feb. 28th, 5.5 Apr. 27th

HUMIDITY.

Mean dew point,	40.6
Mean force of vapor,	.4378
Mean relative humidity,	71.1

WIND.

Prevailing Directions.

North,	15%
South,	11%
North West,	11%
South, South West,	10%
Total movement,	54648 m.
Greatest daily movement,	410 m. Apr. 5th
Least daily movement,	18 m. Feb. 25th
Mean daily movement,	149.6 m.
Mean hourly velocity,	6.2 m.
Max. pressure per sq. ft.,	27¾ lbs.=74 m. per hr. Jan. 8, 3 A.M.

PRECIPITATION.

Total rain-fall or melted snow,	39.48 in. 48.5 in.
Number of days on which .01 of rain. or melted snow fell,	141.
Total snow fall in inches,	43½

WEATHER.

Mean cloudiness observed,	57%
Total cloudiness recorded by the Sun Thermometer,	2279 hrs., or 51%
Number of clear days,	137
Number of fair days,	105
Number of cloudy days,	123

BRIGHT SUNSHINE.

Number of hours recorded,	2194
Mean Ozone,	38%

DATES OF FROSTS.

Last,	May 12th
First,	Sept. 25th

DATES OF SNOW.

Last,	April 8th
First,	Oct. 19th

28 halos were observed. 79 per cent. were accompanied by storm within 24 hours, and 61 per cent. within 48 hours after the occurrence of the halo.

The rain fall was a trifle above the average for fifty years as recorded at Amherst College. The temperature was also above the mean for the same time.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 26. FEBRUARY, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.385, 22d, 6 A.
Actual minimum reading,	29.03, 3d, 6 P.
Mean reduced to sea level,	30.041
Monthly range,	1.355

****Air Temperature.*** In Degrees Fahr.

Highest,	52.; 54
Lowest,	0.0;—6.
Mean,	29.6; 27.6
Monthly Range,	52.; 60.
Highest mean daily,	47.1; 45.
Lowest mean daily,	16.; 11
Mean maximum,	36.1; 37.6
Mean minimum,	22.1; 17.6
Mean daily range,	14.2; 20.
Greatest daily range,	32.; 36.
Least daily range,	35; 8.5

Humidity.

Mean dew point,	21.7
Mean force of vapor,	.1897
Mean relative humidity,	69.4

Wind.

Prevailing Directions.

North West,	17 per cent.
North,	13 " "
South South West,	12 " "
South West,	9 " "
Other directions,	49 " "
Total movement,	4759 m.
Greatest daily movement,	354 m., 4th
Least daily movement,	13 m., 9th
Mean daily movement,	170 m.
Mean hourly velocity,	6.1 m.

Maximum pressure per square foot, 13½ lbs. = 52 m. per hour, 10th, at 12 M.

****Precipitation.*** In inches.

Total precipitation,	3.13; 4.23

Weather.

Mean cloudiness observed,	59 per cent.
Number of clear days,	9
Number of cloudy days,	9
Number of fair days,	10

Total cloudiness recorded by the Sun Thermometer, 173 hours or 58 per cent.

Number of days on which .01 inch or more rain or snow fell,	13
Depth of snow, in inches, on ground at close of month,	3

Bright Sunshine.

Number of Hours recorded,	1.24

Snow, 6th, 7th, 8th, 9th, 20th, 26th, 28th.

Total Fall in inches,	16

Rain, 1st. 3d, 9th, 10th, 16th, 17th, 18th, 20th, 21st, 25th.

Hail,	9th, 20th.
Lightning,	28th.
Mean Ozone,	49 per cent.

Halos.

Solar,	5th, 6th, 7th, 23d, 28th.
Lunar,	15th, 19th.
Lunar coronae,	15th, 18th, 19th, 23d.

Gales, of 50 or more miles per hour, 52, N.W., 10th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.925	29.635	29.66	45.5	46.5	3 P	34.5	31.5	8 A	40.3	60
2	30.30	29.76	30.223	42.	42.	1 A	23.	19.5	12 P	32.8	60
3	30.28	29.325	29.663	36.5	38.5	8 P	23.5	16.	1 A	28.5	20
4	30.36	29.56	30.00	24.	31.	1 A	9.5	6.	12 P	16.5	50
5	30.60	30.36	30.483	24.5	24.	5 P	6.	–2.	3 A	16.	30
6	30.36	29.98	30.057	40.	40.	2 P	24.	20.5	1 A	32.9	50
7	30.065	29.90	29.978	37.	38.	3 P	24.	20.	8 A	31.	40
8	30.38	29.90	30.113	30.5	32.	1 A	20.	13.	12 P	27.1	70
9	30.44	29.74	30.22	30.	28.5	12 P	18.	14.	6 A	21.9	60
10	29.92	29.575	29.707	38.	39.	11 A	29.	27.	12 P	33.6	40
11	30.31	29.92	30.21	30.	31.5	1 P	21.	17.5	7 A	25.6	60
12	30.34	30.06	30.203	35.	34.5	2 P	11.	5.	7 A	25.2	20
13	30.10	30.00	30.042	38.	44.5	3 P	20.	15.	6 A	29.5	20
14	30.65	30.10	30.455	27.	32.	1 A	8.	6.	12 P	17.2	60
15	30.695	30.19	30.508	32.	30.	12 P	0.0	–6.	7 A	16.8	30
16	30.19	29.69	29.763	48.5	48.5	3 P	33.5	28.	1 A	42.1	60
17	29.755	29.57	29.632	43.5	42.5	1 A	35.	33.	11 P	39.7	40
18	30.11	29.60	29.813	42.5	45.	12 M	29.	26.	12 P	34.7	40
19	30.525	30.11	30.457	31.	31.5	3 P	22.	17.	8 A	26.8	60
20	30.525	30.17	30.378	26.	25.5	2 P	22.5	17.	2 A	24.1	50
21	30.17	29.725	29.805	34.5	35.5	5 P	25.	23.	1 A	31.4	50
22	30.22	29.72	29.882	36.5	39.	10 A	24.	21.	12 P	33.1	60
23	30.525	30.22	30.49	34.	35.	3 P	20.	14.	5 A	27.5	50
24	30.46	30.02	30.25	47.5	49.5	3 P	30.	26.	1 A	40.1	50
25	30.02	29.43	29.59	52.	54.	2 P	43.	36.	1 A	47.1	60
26	29.51	29.39	29.43	44.5	48.5	1 A	27.	26.	11 P	36.4	60
27	30.23	29.39	29.83	27.5	29.5	12 M	19.	16.5	12 P	25.	60
28	30.43	30.16	30.293	36.	37.	7 P	16.	7.	3 A	27.3	50

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	3	34.0	.2835	71.7	W.	135	$2\frac{1}{2}$	22	10 P	0 A	5 A	.48	$\frac{1}{2}$
2	8	20.7	.1739	65.3	W.	162	3	24	5 P				
3	0	22.	.1672	71.7	N.W.	64	$7\frac{3}{4}$	39	9 P	9 A	3-30 P	.21	
4	5	–9.	.0836	38.3	N.W.	354	11	47	3 P				
5	8	10.3	.1081	71.7	S.S.W.	166	3	24	1 P				
6	4	31.	.2195	80.3	S.	216	2	20	4 A	7 A			T.
7	3	26.7	.1968	77.7	S.E.	77	$1\frac{1}{4}$	15	9 P	4-30 P	12 P		
8	0	25.	.1578	87.7	N.	132	$1\frac{1}{4}$	15	3 A	0 A	5 P	.54	$7\frac{1}{2}$
9	0	19.	.1351	79.7	N.	13	0	–	–	12 M	12 P		
10	6	20.7	.1993	58.7	N.W.	191	$13\frac{1}{2}$	52	12 M	0 A	7 A	.89	$1\frac{1}{2}$
11	$10\frac{1}{2}$	10.7	.1351	56.7	N.W.	197	6	35	1-30 P				
12	4	19.	.1665	69.	S.S.W.	85	$1\frac{1}{2}$	17	3-30 P				
13	7	21.	.1868	66.	N.	49	$1\frac{1}{4}$	15	10 30 P				
14	10	3.3	.0878	62.7	N.N.E.	249	$3\frac{1}{2}$	26	2 P				
15	10	10.	.1189	69.3	S.W.	115	$4\frac{1}{2}$	30	9-30 P				$\frac{3}{4}$
16	0	39.7	.3173	78.	S.	298	$4\frac{1}{4}$	29	6 A	†– A	12 P		
17	0	36.7	.2651	82.7	E.	61	.1	5	6 P	0 A	12 P		
18	4	24.	.2088	64.7	N.W.	163	$9\frac{1}{2}$	44	5 P	0 A	8 A	.75	
19	10	21.7	.1484	80.3	N.W.	200	$5\frac{1}{4}$	32	1 A				
20	0	21.3	.1437	80.7	N.	41	$\frac{1}{2}$	10	3 P	6-30 A	12 P		
21	0	30.7	.2078	80.	S.E.	66	$\frac{3}{4}$	12	10–30 P	0 A	9 P	.80	$3\frac{1}{2}$
22	5	14.3	.1813	48.3	N.W.	263	$11\frac{1}{2}$	48	3 P				
23	11	17.7	.1598	64.3	S.	140	5	32	8 P				
24	4	35.3	.3055	69.7	S.	229	$1\frac{1}{2}$	17	7-30 P				
25	0	46.7	.3849	83.3	S.W.	255	$8\frac{1}{4}$	41	3 P	1 A	12 P	.20	
26	0	28.7	.3606	72.7	N.N.E.	236	9	42	10-30 P	2-30 P	12 P	.36	$3\frac{1}{2}$
27	5	5.7	.1291	48.	N.W.	338	9	42	3 P				
28	6	19.3	.1805	65.	S.W.	237	$5\frac{1}{4}$	32	1-30 P	7 P	11 P		T.

†Early morning. T=trace.

The mean pressure was below that of Feb., 1890. The average temperature and mean relative humidity were also below, the prevailing direction of the wind was the same, but a greater movement in miles was recorded the last February. In the month of February, the last two years, .01 inch of water fell on 13 days. There was only 1 % difference in the mean cloudiness for the same periods, but the ozone was 15% higher the last month. Of the halos observed 86% were accompanied with rain or snow within twenty-four hours after the occurrence of the halo. On the evening of the 28th snow squalls were accompanied with frequent flashes of lightning.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 27. MARCH, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.26, 2d, 10 A.
Actual minimum reading,	29.065, 13th, 10 P.
Mean reduced to sea level,	30.099
Monthly range,	1.195

**Air Temperature.* In Degrees Fahr.

Highest,	53.; 56.5
Lowest,	3.;—1.
Mean,	33.7; 32.7
Monthly Range,	50.; 57.5
Highest mean daily,	46.4; 46.5
Lowest mean daily,	11.3; 9.3
Mean maximum,	40.3; 42.2
Mean minimum,	27.; 23.1
Mean daily range,	13.3; 19.1
Greatest daily range,	23.; 31.5
Least daily range,	2; 6.5

Humidity.

Mean dew point,	22.6
Mean force of vapor,	.2149
Mean relative humidity,	63.7

Wind.

Prevailing Directions.

North,	33 per cent.
North North East,	16 " "
North West,	16 " "
South,	8 " "
Other directions,	27 " "
Total movement,	6261 m.
Greatest daily movement,	443 m., 14th
Least daily movement,	78 m., 31st
Mean daily movement,	202 m.
Mean hourly velocity,	8.4 m.
Maximum pressure per square foot, 10½ lbs.= 46 m. per hour, 14th, at 9 A.	

**Precipitation.* In inches.

Total precipitation,	1.97; 2.99

Weather.

Mean cloudiness observed,	55 per cent.
Number of clear days,	14
Number of cloudy days,	10
Number of fair days,	7
Total cloudiness recorded by the Sun Thermometer, 175 hours or 47 per cent.	
Number of days on which .01 inch or more rain or snow fell,	9
Depth of snow, in inches, on ground at close of month,	0

Bright Sunshine.

Number of Hours recorded,	194¾
Snow,	3rd, 4th, 7th, 14th, 16th, 19th, 21st,
Total Fall in inches,	9
Rain,	8th, 9th, 10th, 12th, 16th, 21st, 22d.
Hail,	21st.
Aurora,	28th.
Mean Ozone,	69 per cent.

Halos.

Solar,	2d, 27th, 31st.
Lunar,	17th, 18th, 22d.
Lunar coronae,	15th, 22d.

Gales, of 40 or more miles per hour, 43, N.W., 10th; S.W. 43, 13th; 46, W. 14th; 41, N.W., 16th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.515	30.15	30.427	29.	36.5	1 A	10.5	9.	12 P	19.2	90
2	30.57	30.475	30.515	20.	19.5	5 P	3.	–1.	7 A	11.3	60
3	30.475	30.15	30.367	27.	27.5	3 P	12.	8.5	3 A	20.4	50
4	30.15	29.76	29.832	26.	28.5	1 P	22.	20.	8 A	23.9	70
5	30.06	29.81	29.933	29.	31.	1 P	20.	14.5	6 A	24.3	70
6	30.11	30.05	30.08	36.5	39.	4 P	18.	10.5	7 A	26.	60
7	30.145	30.07	30.095	46.	43.5	2 P	27.	23.	4 A	33.9	60
8	30.16	30.10	30.122	43.	45.5	3 P	22.	18.	6 A	33.9	60
9	30.18	29.80	30.073	37.5	39.	2 P	35.5	32.5	7 A	36.7	70
10	30.35	29.80	30.145	38.5	39.5	2 P	30.	25.	12 P	35.4	70
11	30.44	30.35	30.402	47.	49.5	4 P	24.	18.	6 A	35.8	50
12	30.395	30.105	30.273	42.	42.5	2 P	34.5	31.	6 A	39.	60
13	30.105	29.355	29.56	42.5	44.5	5 P	38.5	34.	2 A	40.6	60
14	29.95	29.43	29.692	38.	44.5	1 A	25.	22.	12 P	32.9	70
15	30.29	29.95	30.225	33.	32.	5 P	22.5	18.5	7 A	27.7	70
16	30.17	29.87	29.977	44.	47.	12 M	22.	22.	12 P	31.9	70
17	30.295	30.07	30.242	31.	30.5	5 P	15.	11.	6 A	22.5	90
18	30.23	29.91	30.015	48.	49.5	2 P	26.	18.5	1 A	37.1	60
19	30.35	29.93	30.20	39.	39.5	1 A	31.	28.	11 P	35.	70
20	30.375	30.30	30.335	34.5	34.5	4 P	30.	27.	8 A	31.9	80
21	30.30	29 805	29.992	37.	38.5	10 P	31.	28.5	7 A	33.4	80
22	29.805	29.725	29.742	48.	52.	1 P	36.5	34.5	1 A	43.8	70
23	30.15	29.77	30.017	48.5	50.5	1 P	41.	39.	11 P	46.4	70
24	30.19	30.125	30.16	52.	55.	5 P	40.	36.5	2 A	44.5	70
25	30.26	30.12	30.148	46.	49.5	5 P	32.	31.5	12 P	40.8	60
26	30.40	30.26	30.355	38.	41.	4 P	27.	21.5	6 A	31.7	70
27	30.38	30.10	30.247	44.5	45.	3 P	25.5	19.	6 A	35.6	90
28	30.10	29.79	29.878	51.	54.5	4 P	33.	27.5	2 A	42.3	70
29	29.98	29.805	29.865	53.	56.5	2 P	40.5	36.5	6 A	45.8	80
30	30.10	29.98	30.05	51.	53.5	4 P	35.	31.	12 P	42.8	80
31	30.16	30.05	30.093	50.	49.5	2 P	28.	20.5	6 A	39.4	70

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	11	2.	.0953	53.7	N.W.	217	2¾	23	2-30 A				
2	11	3.	.0818	65.7	N.	182	6½	36	8-30 A				
3	3	13.7	.1259	70.7	E.	121	1¼	16	6 P	12-30 P	12 P		
4	0	22.3	.1378	87.7	N.	295	6½	36	11 P	0 A	9 P	.59	9
5	6	12.7	.1390	59.	N.W.	268	6¼	35	3 P				
6	11	16.3	.1557	61.7	N.N.W.	127	1	14	6 A				
7	6	20.3	.1971	60.3	N.	97	2	20	1 A	8 A			T.
8	7	21.	.2225	55.3	N.	91	2½	22	2 A	8-30 P	12 P		
9	0	35.	.2435	83.7	E.	105	½	10	1 P	0 A	12 P		
10	11	19.7	.1962	57.7	N.W.	246	9½	44	1-30 P	0 A	3 A	1.73	
11	12	25.	.2440	61.	S.	104	1¾	19	7 P				
12	1	34.7	.2651	77.	S.	94	0	–	–	2 P	12 P		
13	0	39.3	.2771	87.3	S.W.	133	9½	44	11 P	0 A	6-30 P	.48	
14	4	14.7	.1656	54.	W.	443	10½	46	9 A	6 P			T.
15	12	11.	.1504	50.	N.W.	230	5½	33	12 P				
16	4	13.	.1896	52.3	S.W.	319	8½	41	5 P	1 P		T.	T.
17	12	4.7	.1242	45.7	N.W.	191	3½	26	1-30 A				
18	8	26.	.2543	59.3	S.W.	197	4¼	29	9-30 A				
19	1	24.3	.2009	66.3	N.N.E.	253	5¼	32	6 A	8-30 A	9 A		T.
20	0	27.3	.1849	80.	N.E.	244	2½	22	12 P				
21	0	30.3	.2066	83.3	N.N.E.	311	2¾	23	3 A	†– A	12 P		
22	0	43.	.3331	84.	N.	137	1	14	9 P	0 A	4-30 P	.19	T.
23	0	40.3	.3417	74.	N.	195	2	20	6-30 P				
24	0	39.3	.3349	73.	N.N.E.	126	¼	8	4 A				
25	12¼	21.3	.2473	49.7	N.	252	3¾	27	2 P				
26	12½	23.3	.1794	72.7	N.	283	3¾	27	5 P				
27	8	20.3	.2167	55.3	N.W.	92	¼	8	2-30 P				
28	12	21.3	.2837	44.	N.	232	7½	39	3 P				
29	11½	28.3	.3271	50.	N.	310	7½	39	4-30 P				
30	12½	19.3	.2721	41.7	N.	276	4½	30	3 P				
31	6	27.7	.2729	59.7	S.	78	¼	8	2 P				

†Early morning. T=trace.

REMARKS.

The temperature was above normal. The number of clear days was 14 against 9 in March of the preceding year. The precipitation was below normal. Six halos were observed, three were accompanied with precipitation within twenty-four hours after the occurrence of the halo. The mean ozone was 69, the highest ever recorded at the Station.

The prevailing direction of the wind for March the last two years, was North.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

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METEOROLOGICAL OBSERVATORY

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Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 28. APRIL, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.27, 10th, 9 A.
Actual minimum reading,	28.84, 3d, 9 A.
Mean reduced to sea level,	29.923
Monthly range,	1.43

**Air Temperature.* In Degrees Fahr.

Highest,	77.; 79.5
Lowest,	27.;18.
Mean,	49.4; 47.5
Monthly Range,	51.; 61.5
Highest mean daily,	64.5; 65.5
Lowest mean daily,	34.9; 28.8
Mean maximum,	58.; 59.5
Mean minimum,	40.8; 35.6
Mean daily range,	17.2; 23.3
Greatest daily range,	32.; 43.5
Least daily range,	5; 8.5

Humidity.

Mean dew point,	36.3
Mean force of vapor,	.4083
Mean relative humidity,	60.1

Wind.

Prevailing Directions.

North West,	26 per cent.
North,	18 " "
South South West,	12 " "
South,	12 " "
Other directions,	32 " "
Total movement,	5484 m.
Greatest daily movement,	297 m., 28th
Least daily movement,	79 m., 10th
Mean daily movement,	182.8 m.
Mean hourly velocity,	7.6 m.

Maximum pressure per square foot, 14 lbs. = 53 m. per hour, 18th, at 6 P.

**Precipitation.* In inches.

Total precipitation,	1.55; 2.66

Weather.

Mean cloudiness observed,	49 per cent.
Number of clear days,	17
Number of cloudy days,	8
Number of fair days,	5

Total cloudiness recorded by the Sun Thermometer, 161 hours or 41 per cent.

Number of days on which .01 inch or more rain or snow fell,	6
Depth of snow, in inches, on ground at close of month,	0

Bright Sunshine.

Number of Hours recorded,	240½

Snow, 2 d, 3d, 4th, 7th, 25th.

Total Fall in inches,	11

Rain, 3d, 11th, 14th, 15th, 18th, 19th, 23d, 25th.

Frost,	21st.
Aurora,	8th.
Thunder and Lightning,	15th, 18th.
Mean Ozone,	62 per cent.

Halos.

Solar,	6th, 10th, 14th, 26th.
Lunar,	19th, 22d, 23d.
Lunar corona,	16th.

Gales, of 40 or more miles per hour, 46, N. 3d; 53 S.S.W. 18th; 46, N.W., 28th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.115	30.065	30.095	51.	52.5	2 P	34.5	31.	5 A	42.1	70
2	30.115	29.825	30.002	52.	50.5	2 P	34.5	32.5	12 P	41.9	70
3	29.825	29.135	29.202	38.	39.	2 P	33.	30.5	7 A	36.	80
4	29.64	29.33	29.512	43.	42.	11 A	34.	30.	11 P	38.3	80
5	29.875	29.645	29.778	39.	38.	4 P	32.	25.	6 A	34.9	70
6	29.90	29.81	29.855	42.5	44.5	5 P	27.	18.	6 A	35.4	70
7	29.95	29.92	29.852	38.5	36.5	6 P	29.5	21.	6 A	34.9	60
8	30.21	29.95	30.095	46.	45.	4 P	32.5	26.	5 A	38.6	60
9	30.485	30.215	30.392	52.	54.	4 P	31.	23.	5 A	41.6	70
10	30.56	30.485	30.52	56.	55.5	2 P	34.	27.5	5 A	44.2	50
11	30.49	30.00	30.258	49.	50.	3 P	41.	35.5	4 A	45.7	60
12	30.00	29.85	29.895	53.	55.	4 P	47.	43.	12 P	49.9	80
13	30.08	29.93	30.05	58.	58.	5 P	45.	40.5	5 A	50.6	50
14	30.08	29.97	30.022	73.	77.5	2 P	46.	38.	6 A	59.5	50
15	30.105	30.00	30.055	58.	61.5	1 A	44.	40.5	8 P	48.	70
16	30.18	30.105	30.133	63.5	67.5	4 P	44.	39.	1 A	52.9	70
17	30.28	30.16	30.218	67.5	70.	4 P	42.5	35.0	5 A	54.6	60
18	30.17	29.81	29.95	73.	77.	3 P	48.	44.	5 A	59.7	70
19	29.95	29.83	29.845	70.	76.	12 M	56.5	55.	12 P	63.9	80
20	30.26	29.95	30.135	65.	67.	4 P	50.	45.	12 M	56.9	60
21	30.38	30 21	30.283	66.	67.	4 P	44.	38.5	5 A	54.1	50
22	30.22	29.70	29.852	75.	77.5	5 P	46.5	43.	3 A	62.	70
23	29.70	29.45	29.513	70.	72.	2 P	56.	56.	12 P	64.5	50
24	29.555	29.48	29.52	60.	60.5	4 P	45.	43.	12 P	51.9	70
25	29.685	29.525	29.558	44.5	47.5	11 A	38.	33.5	12 P	41.4	60
26	29.95	29.685	29.887	59.	60.5	5 P	36.	28.	2 A	48.2	50
27	29.96	29.79	29.862	77.	79.5	5 P	46.	38.5	3 A	63.3	40
28	29.845	29.74	29.787	64.	65.	1 A	43.	39.	12 P	56.1	50
29	29.845	29.78	29.81	59.	58.5	5 P	39.	33.	4 A	47.4	50
30	29.79	29.67	29.725	77.	79.	3 P	45.	35.5	2 A	62.9	40

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	4	27.3	.3206	49.7	S.	144	$1\frac{3}{4}$	19	9 P				
2	3	27.3	.2837	54.3	S.	254	$1\frac{1}{2}$	17	3 P	9 P	12 P		
3	0	27.3	.2206	68.3	N.	290	$10\frac{1}{2}$	46	6 A	0 A	11 A	.91	11
4	0	24.3	.2590	55.3	N.W.	168	2	20	8 P	3 P	4 P		T.
5	11	20.7	.1912	61.7	N.W.	178	$1\frac{1}{2}$	17	8 A				
6	13	26.3	.2206	66.7	N.	67	$\frac{1}{2}$	10	3-30 P				
7	6	21.	.1990	61.7	N.W.	165	$4\frac{1}{4}$	29	3-30 P	11-30 A			T.
8	10	21.3	.2350	51.7	N.W.	147	$1\frac{1}{2}$	17	1-30 P				
9	13	29.	.2808	59.7	N.	98	$\frac{3}{4}$	12	9 A				
10	12	32.7	.3371	59.7	S.S.W.	79	$1\frac{1}{2}$	17	4 P				
11	0	42.7	.3200	85.7	S.	236	$2\frac{1}{2}$	23	8 P	4 A	12 P		
12	1	36.	.3546	61.	N.W.	258	$4\frac{1}{2}$	30	5 P	0 A	†– A	1.22	
13	8	38.3	.3818	62.	W.N.W	178	3	24	3 P				
14	6	48.3	.6195	62.	S.S.W.	197	$2\frac{1}{2}$	23	2 P	8-30 P		T.	
15	0	41.7	.3306	79.3	N.E.	140	1	14	1 A	0 A	7 P	.39	
16	9	44.7	.4622	67.3	N.W.	125	$1\frac{1}{2}$	17	3-30 P				
17	$13\frac{1}{2}$	44.	.4585	67.7	S.S.W.	94	$1\frac{1}{4}$	16	5 P				
18	12	53.7	.6312	71.	S.W.	213	14	53	6 P	6-30 P	8 P	.14	
19	11	52.7	.6844	60.	N.W.	203	$5\frac{1}{4}$	32	2 P	11-30 A		T.	
20	13	38.	.4664	51.7	N.	229	4	28	3 P				
21	12	41.	.4807	56.	S.W.	109	$1\frac{1}{4}$	16	3 P				
22	11	52.3	.6930	64.	N.W.	242	$2\frac{1}{2}$	22	2 P				
23	1	50.	.6500	58.3	S.W.	171	$2\frac{3}{4}$	23	6 P	7-30 A	1 P	T.	
24	11	32.	.3791	49.7	N.	221	$6\frac{1}{2}$	36	9 A				
25	1	30.7	.2596	68.	N.	241	$6\frac{1}{2}$	36	6 P	11 A	3 P	T.	T.
26	10	33.7	.3818	52.	N.	169	4	28	11-30 A				
27	12	47.7	.7028	51.	W.	128	3	24	3-30 P				
28	11	39.	.4396	59.	N.W.	297	$10\frac{1}{2}$	46	3 P				
29	12	24.7	.3205	46.	N.N.W.	286	6	37	6-30 A				
30	14	41.	.6838	42.	W.N.W	157	$4\frac{1}{4}$	29	4 P				

†Early morning. T=trace.

REMARKS.

The mean temperature was about normal, the precipitation was greater than that of 1890. A heavy snow storm occurred on the 2d and 3d. Seven halos were observed, five of which were accompanied with precipitation within twenty-four hours after the occurrence of the halo. A cold wave occurred about the 21st. Frogs were first heard on the 11th. High temperature, excessive sunshine, and a small amount of precipitation produced a marked change in vegetation the last ten days; grass is forward, fruit trees are putting forth blossoms. Some plowing and sowing has been done and early potatoes planted.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 29. MAY, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.16, 20th, 11 A.
Actual minimum reading,	29.37, 1st, 4 A.
Mean reduced to sea level,	29.983
Monthly range,	.79

**Air Temperature.* In Degrees Fahr.

Highest,	85; 87
Lowest,	33.; 25.
Mean,	57.3; 55.6
Monthly Range,	52.; 62.
Highest mean daily,	68.9; 69.8
Lowest mean daily,	40.2; 37.8
Mean maximum,	67.5; 69.2
Mean minimum,	47.7; 42.
Mean daily range,	20. ; 27.2
Greatest daily range,	39.; 51.5
Least daily range,	5; 10.5

Humidity.

Mean dew point,	44.6
Mean force of vapor,	.5501
Mean relative humidity,	59.3

Wind.

Prevailing Directions.

North,	22 per cent.
South,	15 “ “
South South West,	11 “ “
North West,	9 “ “
Other directions.	43 “ “
Total movement,	4610 m.
Greatest daily movement,	326 m., 17th
Least daily movement,	42 m., 30th
Mean daily movement,	148.7 m.
Mean hourly velocity,	6.2 m.

Maximum pressure per square foot, 10¾ lbs.= 46 m. per hour, 4th, at 4 P.

**Precipitation.* In inches.

Total precipitation,	1.64; 1.97

Weather.

Mean cloudiness observed,	54 per cent.
Number of clear days,	10
Number of cloudy days,	10
Number of fair days,	11

Total cloudiness recorded by the Sun Thermometer, 226 hours or 50 per cent.

Number of days on which .01 inch or more rain fell,	10
Depth of snow, in inches, on ground at close of month,	0

Bright Sunshine.

Number of Hours recorded,	226½

Snow, 5th.

Total Fall in inches,	T.

Rain, 3d, 4th, 6th, 11th, 12th, 15th, 16th, 18th, 21st, 22d, 26th 29th, 30th, 31st.

Frost, 5th, 6th, 7th, 17th, 19th.

Thunder and Lightning, 11th, 26th.

Mean Ozone, 61 per cent.

Halos.

Solar,	2d, 19th, 20th, 25th, 27th, 28th.
Lunar corona,	21st.

Gales, of 40 or more miles per hour, 46, W. 4th; 40, W. 5th; 41, N.W., 17th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.71	29.65	29.662	74.	76.	2 P	56.	50.	12 P	64.1	50
2	29.96	29.715	29.907	72.5	70.	4 P	49.5	39.	5 A	58.2	50
3	29.96	29.895	29.923	56.	58.	6 P	49.	44.	12 P	51.5	60
4	29.96	29.84	29.898	64.	66.	1 P	40.	37.	12 P	52.5	60
5	29.93	29.875	29.907	45.	46.5	2 P	36.	31.	3 A	40.2	70
6	29.92	29.85	29.90	49.5	50.5	6 P	33.	25.	4 A	42.	70
7	30.09	29.90	30.042	56.	57.	4 P	38.	32.	4 A	47.4	60
8	30.09	29.85	29.947	65.	67.5	2 P	46.	39.	2 A	56.9	50
9	29.88	29.825	29.85	79.	80.5	4 P	53.	44.5	4 A	64.7	60
10	29.885	29.775	29.837	85.	87.	4 P	46.	35.5	5 A	66.9	50
11	29.85	29.78	29.788	83.	85.	3 P	56.	47.5	5 A	65.3	50
12	30.10	29.85	30.025	56.5	58.	2 P	51.	47.5	3 A	53.1	70
13	30.10	30.00	30.048	74.	74.5	5 P	48.	42.5	4 A	59.9	50
14	30.04	30.005	30.018	76.	76.	3 P	45.	37.5	5 A	62.	50
15	30.10	30.03	30.073	72.	72.5	3 P	50.	44.	5 A	60.9	60
16	30.065	29.75	29.845	56.	58.	1 A	48.5	47.5	12 P	52.7	70
17	29.895	29.75	29.84	56.	56.	5 P	44.	40.	12 P	48.5	80
18	29.91	29.825	29.893	60.	61.5	5 P	43.	36.	5 A	50.3	60
19	30.33	29.91	30.158	67.	68.5	4 P	37.	27.5	5 A	53.4	60
20	30.41	30.33	30.112	70.	74.5	2 P	45.	37.	5 A	59.9	50
21	30.43	30.13	30.278	72.	75.	3 P	58.5	55.5	5 A	64.1	70
22	30.13	29.85	29.907	75.	78.5	4 P	57.	57.	12 P	65.1	70
23	30.11	29.895	30.077	72.	70.	6 P	49.	44.	5 A	56.9	80
24	30.125	30.06	30.093	67.5	69.5	3 P	48.	41.5	3 A	56.6	60
25	30.07	29.915	29.988	76.	77.	5 P	51.	46.	2 A	63.4	60
26	30.04	29.85	29.923	69.	72.	1 P	49.	50.	12 P	58.5	70
27	30.20	30.01	30.17	71.	70.	5 P	43.5	35.5	5 A	56.1	70
28	30.21	30.10	30.16	79.	78.5	5 P	44.	36.5	5 A	62.7	70
29	30.12	29.98	30.043	55.	61.	1 A	50.	42.	4 A	52.6	60
30	29.99	29.91	29.952	69.	69.	3 P	54.	52.5	1 A	62.2	70
31	29.915	29.91	29.913	79.	81.	4 P	62.	58.5	4 A	68.9	30

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	6	41.3	.6298	45.3	N.W.	131	$3\frac{3}{4}$	27	7 P				
2	8	46.7	.6031	56.3	S.S.W.	104	$1\frac{1}{2}$	17	4 P				
3	2	42.7	.3875	71.	S.	145	$1\frac{1}{2}$	17	6 A	8 A	2-30 P	.16	
4	7	28.7	.4340	40.	W.	216	$10\frac{3}{4}$	46	4 P	3 P		T.	
5	2	25.3	.2583	54.	W.	278	8	40	1 P	11-30 A			T.
6	4	29.7	.2811	61.7	N.W.	109	$3\frac{1}{4}$	25	8 P	6 P	9 P	.04	
7	6	31.3	.3549	51.3	N.W.	182	$2\frac{3}{4}$	23	12 M				
8	5	38.7	.5183	45.	W.	167	$7\frac{1}{2}$	39	2 P				
9	11	50.3	.7090	57.	N.W.	131	$1\frac{1}{2}$	17	12-30 P				
10	14.5	50.	.8340	50.	S.W.	89	2	20	4 P				
11	9	51.	.7407	55.3	N.	124	5	32	7 P	11 P	12 P		
12	0	42.7	.4404	63.3	N.E.	209	3	24	4 A	0 A	2 A	.06	
13	14.5	44.3	.5905	52.3	N.	122	1	14	2-30 P				
14	10	46.	.6552	53.3	S.	52	0						
15	8	47.3	.6090	56.	N.	156	$2\frac{1}{4}$	21	7 P	6-30 P	12 P		
16	0	48.7	.3931	87.	N.	115	2	20	11 P	0 A	5 P	.46	
17	14	26.7	.3380	41.	N.	326	$8\frac{1}{2}$	41	2 P				
18	3	36.	.3690	58.	S.	196	$4\frac{1}{2}$	30	3 P	8-30 A		T.	
19	14	36.	.4662	49.7	S.W.	98	$\frac{3}{4}$	12	8 P				
20	9	52.7	.6452	64.3	S.W.	139	3	24	3 P				
21	2	57.	.6885	69.7	S.	275	$3\frac{1}{2}$	26	2 P	7-15 A	5 P	.01	
22	3	53.7	.6939	60.7	N.	143	$3\frac{1}{2}$	26	8-30 P	8 A	2 P	T.	
23	14.5	40.3	.4906	54.	N.	231	7	37	9 A				
24	10	45.7	.5782	56.3	S.W.	116	$1\frac{1}{2}$	17	12-30 P				
25	11	53.7	.6763	62.7	S.S.W.	127	2	20	4 P				
26	2	53.	.5252	78.	N.N.E.	180	$3\frac{1}{2}$	26	8 P	1 P	1-30 P	.36	
27	15	44.7	.5164	60.7	N.	124	$1\frac{1}{2}$	17	8 A				
28	12	48.3	.6955	53.	N.W.	63	$\frac{1}{4}$	7	8 P				
29	0	51.3	.4272	88.	N.	144	1	14	11 A	†–A	12 P		
30	0	58.3	.6795	73.3	S.W.	42	$\frac{1}{4}$	7	1 P	0 A	6 P	.88	
31	10	59.7	.8156	65.7	S.E.	76	$\frac{1}{2}$	10	5-30 P	3 P		T.	

†Early morning. T=trace.

REMARKS.

The weather during the month has been exceedingly changeable although the mean temperature was about normal, the first four days were warm and pleasant, but on the 5th frost occurred, a trace of snow fell and a thick coating of ice formed about the fountain on the college grounds. On the morning of the 6th the ground was frozen to the depth of one-half inch, and the tender leaves of maple and chestnut trees were destroyed. A heavy frost occurred on the 19th and tender plants were cut down, and fruit somewhat injured. The rain fall was below normal and grass on uplands suffered from drought; but the rain which fell during the last few days of the month revived vegetation, and the condition of early crops is much improved. Six halos were observed, four were accompanied by precipitation within twenty-four hours after the occurrence of the halo.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 30. **JUNE, 1891.**

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	29.94, 6th, 10 A.
Actual minimum reading,	29.41, 28th, 2 P.
Mean reduced to sea level,	29.919
Monthly range,	.53

****Air Temperature.*** In Degrees Fahr.

Highest,	91.5; 94
Lowest,	40.; 34.
Mean,	66.6; 65.2
Monthly Range,	51.5; 60.
Highest mean daily,	79.6; 76.
Lowest mean daily,	52. ; 51.
Mean maximum,	76. ; 78.5
Mean minimum,	57. ; 51.9
Mean daily range,	19. ; 26.6
Greatest daily range,	34.5; 44.
Least daily range,	3; 10.

Humidity.

Mean dew point,	57.
Mean force of vapor,	.7811
Mean relative humidity,	65.3

Wind.

Prevailing Directions.

North,	16 per cent.
South,	15 " "
North North East,	13 " "
South West,	9 " "
Other directions,	47 " "

Total movement,	3713 m.
Greatest daily movement,	409 m., 27th
Least daily movement,	32 m., 7th
Mean daily movement,	123.8 m.
Mean hourly velocity,	5.2 m.

Maximum pressure per square foot, 10½ lbs. = 46 m. per hour, 24th, at 11.30 A.

****Precipitation.*** In inches.

Total precipitation,	4.36; 4.75

Weather.

Mean cloudiness observed,	47 per cent.
Number of clear days,	14
Number of cloudy days,	8
Number of fair days,	8

Total cloudiness recorded by the Sun Thermometer, 208 hours or 46 per cent.

Number of days on which .01 inch or more rain fell,	9

Bright Sunshine.

Number of Hours recorded,	248

Rain, 2d, 3d, 4th, 13th, 16th, 17th, 18th, 19th, 20th, 21st, 22d, 26th.

Thunder and Lightning, 2d, 3d, 16th, 26th

Mean Ozone, 56 per cent.

Halos.

Solar,	5th, 6th, 7th.
Lunar corona,	12th.

Gales, of 40 or more miles per hour, 46, N. 24th; 41, N.N.E. 27th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.91	29.77	29.833	79.	81.5	3 P	59.	52.	4 A	69.4	60
2	29.90	29.79	29.867	80.	84.5	2 P	60.	55.5	4 A	66.3	70
3	29.96	29.90	29.927	79.	81.5	2 P	60.	60.	12 P	68.3	40
4	30.105	29.905	30.023	59.	65.5	1 A	46.	43.5	12 P	52.	60
5	30.19	30.105	30.157	66.	68.	2 P	40.	34.	4 A	55.3	60
6	30.22	30.14	30.177	68.	68.	5 P	44.	38.	4 A	57.8	50
7	30.145	30.06	30.095	70.	70.	2 P	49.	42.5	4 A	59.6	40
8	30.165	30.08	30.118	82.	83.5	5 P	47.5	39.5	5 A	66.1	30
9	30.135	30.04	30.09	82.	83.5	2 P	55.	45.	5 A	70.8	40
10	30.09	29.98	30.04	82.	84.	2 P	58.5	49.	4 A	70.7	70
11	30.02	29.895	29.953	84.5	89.	4 P	61.	55.	3 A	73.5	60
12	29.94	29.89	29.907	80.	82.5	3 P	65.	60.	3 A	71.9	50
13	30.11	29.94	30.063	84.	84.	3 P	57.	48.	4 A	71.8	50
14	30.075	29.97	30.02	87.	88.	4 P	57.	49.	4 A	73.9	50
15	29.98	29.90	29.928	91.	92.5	3 P	64.	57.	4 A	79.6	60
16	29.905	29.725	29.805	91.5	94.	4 P	66.	58.	4 A	79.6	70
17	29.865	29.735	29.787	78.	81.5	10 A	54.	53.5	11 P	62.0	50
18	29.885	29.87	29.873	54.	58.	1 A	51.	48.	12 P	52.7	90
19	29.87	29.81	29.815	61.	63.5	5 P	51.	53.	1 A	56.4	80
20	29.90	29.81	29.86	69.	71.	3 P	59.	55.	3 A	64.	70
21	29.91	29.88	29.90	73.	75.	4 P	63.	60.	1 A	67.1	50
22	29.88	29.77	29.795	70.	73.	2 P	64.	62.	4 A	66.3	50
23	29.77	29.72	29.753	81.	85.	2 P	65.	62.	1 A	72.1	30
24	29.91	29.77	29.85	70.	73.5	3 P	59.	57.	12 P	65.2	60
25	29.92	29.83	29 875	83.	86.	4 P	54.	48.	4 A	69.5	60
26	29.84	29.745	29.803	86.	88.	2 P	66.	59.5	3 A	75.7	60
27	29.89	29.79	29.877	67.	72.	3 P	56.	51.	4 A	60.8	70
28	29.87	29.69	29.73	70.	72.	3 P	55.	46.5	2 A	63.9	60
29	29.77	29.70	29.743	76.	79.5	4 P	62.	57.	5 A	68.	60
30	29.98	29.77	29.903	76.	77.	2 P	62.	58.	12 P	68.1	60

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	10	62.	.8236	70.7	S.S.W.	130	1¼	16	4 P				
2	5	62.7	.8539	71.3	S.S.W.	136	2½	22	4 P	3 P	10-30 P	1-73	
3	6	64.3	.8550	72.	S.E.	75	1½	17	6-30 P	7-30 P	12 P		
4	0	46.7	.3974	81.3	N.N.E.	191	2½	22	5 P	0 A	3 A	1.24	
5	15	41.7	.4924	59.7	N.W.	84	2	20	4 P				
6	8	47.	.5486	61.7	S.W.	48	½	10	1 P				
7	11	49.	.6100	61.	W.	32	0						
8	15	49.7	.7303	56.7	N.N.W.	46	½	10	2 P				
9	15	51.3	.8563	47.3	S.W.	77	¾	12	2 P				
10	14	57.7	.8950	57.3	S.	122	1	14	3 P				
11	15	63.7	.9619	62.3	S.	147	1¼	16	5 P				
12	8	57.	.9111	54.3	W.N.W	172	2	20	2 P				
13	14	60.	.9447	56.3	N.N.E	63	½	10	9 A	7 A	9 A	T.	
14	15	59.7	1.0330	54.3	W.	106	1½	17	11 A				
15	15	66.	1.1562	57.7	W.	136	1¾	19	1 P				
16	12	67.	1.1876	61.	W.N.W	111	3¼	25	5 P	6 P	9 P	T.	
17	0	60.	.7194	73.7	E.	165	2¼	21	1 P	6 P	12 P		
18	0	49.7	.4069	88.	N.N.E.	150	1¼	16	7 A	0 A	8 P	1.15	
19	0	54.3	.5509	77.	N.	102	¾	12	6-30 A	7 P	12 P		
20	0	60.3	.6811	78.	E.S.E.	70	0			0 A	5 A	.05	
21	0	61.7	.7989	78.	S.S.W.	52	¼	7	2 P	5-30 P	12 P		
22	0	64.	.7277	82.7	N.E.	55	0			0 A	7-30 P	.58	
23	8	61.3	.9187	62.3	N.W.	122	2½	22	4 P				
24	9	55.3	.6191	71.	N.	259	10½	46	11-30 A				
25	15	58.	.8782	59.3	N.	147	1½	17	8 P				
26	10	64.3	1.0398	60.7	N.	78	4¾	31	11-30 P	12 M		T.	
27	8	47.7	.5712	60.	N.N.E.	409	8½	41	1 A				
28	10	49.	.6858	51.3	N.N.E.	237	5½	33	2 P				
29	7	56.3	.7781	60.7	N.N.E.	147	2½	22	6-30 A				
30	3	58.	.8013	61.3	S.S.E.	90	¾	12	12-30 A				

T=trace.

REMARKS.

The temperature was above normal. The rainfall was above the average for 49 years. Eight per cent. more rain fell at base of tower than at the top.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 31. JULY, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.09, 22d, 7 A.
Actual minimum reading,	29.35, 8th, 1 A.
Mean reduced to sea level,	29.986
Monthly range,	74.

**Air Temperature.* In Degrees Fahr.

Highest,	86; 90
Lowest,	51; 41.5
Mean,	68.2; 66.3
Monthly Range,	35 ;48.5.
Highest mean daily,	76.3; 76.5
Lowest mean daily,	62.6; 57.3
Mean maximum,	76.2; 78.4
Mean minimum,	60.1; 54.2
Mean daily range,	16.1; 21.2
Greatest daily range,	30. ; 37.5
Least daily range,	8; 12.5

Humidity.

Mean dew point,	58.5
Mean force of vapor,	.7778
Mean relative humidity,	66.1

Wind.

Prevailing Directions.

South,	15	per	cent.
North,	14	"	"
South South West,	13	"	"
South West,	13	"	"
Other directions,	45	"	"

Total movement,	3907 m.
Greatest daily movement,	234 m., 6th, 15th
Least daily movement,	41m., 17th
Mean daily movement,	126 m.
Mean hourly velocity,	5.3 m.

Maximum pressure per square foot, 4½ lbs.= 30 m. per hour, 31st, at 10 A.

**Precipitation.* In inches.

Total precipitation,	4.93; 5.28

Weather.

Mean cloudiness observed,	51 per cent.
Number of clear days,	11
Number of cloudy days,	10
Number of fair days,	10

Total cloudiness recorded by the Sun Thermometer, 240½ hours or 52 per cent.

Number of days on which .01 inch or more rain fell,	9

Bright Sunshine.

Number of Hours recorded,	222½

Rain, 2d, 4th, 5th, 6th, 7th, 9th, 15th, 18th, 24th, 25th, 28th, 29th, 30th.

Thunder and Lightning, 4th, 15th, 20th, 24th, 25th.

Rainbow, ... 4th.

Mean Ozone, ... 46 per cent.

Halos.

Solar,	8th, 9th, 12th. 18th, 19th, 20th.
Lunar,	19th.

Gales, of 30 or more miles per hour, 30, N. 31st;

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
DAY.	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.07	29.98	30.037	79.	80.	3 P	57.	50.5	5 A	67.4	60
2	30.07	29.99	30.037	67.5	68.5	1 P	59.	55.	4 A	63.6	50
3	29.99	29.805	29.883	73.	75.5	3 P	59.	54.5	4 A	65.6	50
4	29.82	29.685	29.715	73.	74.5	4 P	61.	58.5	12 P	66.9	70
5	29.78	29.74	29.76	72.	75.	2 P	58.	50.	3 A	64.7	60
6	29.91	29.745	29.82	71.	74.	3 P	60.	54.	6 A	64.2	70
7	29.95	29.65	29.873	68.	69.5	10 A	58.	51.5	3 A	62.6	70
8	29.91	29.63	29.807	69.	71.	3 P	59.	56.5	1 A	63.2	70
9	30.09	29.91	29.995	72.	75.5	6 P	56.	51.	3 A	63.6	70
10	30.28	30.09	30.22	84.	84.	6 P	54.	46.5	4 A	69.6	50
11	30.30	30.22	30.253	82.	84.	3 P	57.	47.5	4 A	70.7	50
12	30.22	30.07	30.127	83.	85.	5 P	56.	48.	5 A	70.5	60
13	30.14	30.005	30.07	86.	90.	3 P	65.	61.	6 A	75.2	50
14	30.05	29.91	29.97	84.	89.	2 P	68.	64.	1 A	76.2	30
15	29.93	29.76	29.837	81.	86.	1 P	70.	67.	9 P	74.2	40
16	30.03	29.86	29.935	77.	79.	5 P	65.	59.5	12 P	72.1	50
17	30.10	30.03	30.06	85.	86.	4 P	58.	49.5	4 A	72.5	50
18	30.06	29.76	29.942	74.	75.	1 P	60.	52.5	4 A	68.5	60
19	30.055	29.73	29.898	80.	82.	4 P	67.	64.5	12 P	74.2	60
20	30.16	30.055	30.142	80.	80.5	2 P	59.	53.	5 A	70.5	30
21	30.31	30.14	30.237	79.	82.	5 P	62.	60.	12 P	70.5	30
22	30.37	30.28	30.337	82.	83.5	4 P	56.	50.	5 A	69.4	20
23	30.32	30.205	30.267	78.	81.	2 P	63.	57.	1 A	68.9	30
24	30.21	29.89	29.965	78.	80.5	2 P	64.	58.5	1 A	70.6	40
25	29.915	29.845	29 878	77.	81.	12 M	65.	57.5	4 A	72.2	20
26	29.96	29.855	29.922	77.	77.5	4 P	59.	48.	4 A	67.5	30
27	29.99	29.90	29.933	72.	73.	3 P	57.	47.5	4 A	63.8	20
28	30.05	29.99	30.027	70.	73.	4 P	51.	41.5	4 A	63.3	50
29	30.02	29.98	30.003	70.	72.5	3 P	62.	60.	9 P	65.2	30
30	29.98	29.72	29.77	68.	71.5	12 M	60.	56.5	5 A	63.9	40
31	29.89	29.72	29.85	70.	71.	5 P	57.	51.	12 P	63.1	20

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	8	58.3	.7700	65.	S.S.W.	103	$\frac{3}{4}$	12	7-30 P				
2	$\frac{1}{2}$	58.3	.6886	71.7	S.S.W.	80	0			2 P	3 P	T.	
3	1	59.	.7221	70.	S.S.W.	120	2	20	4 P				
4	3	58.	.7171	78.7	W.	181	2	20	2-30 P	3 A	5 P	.31	
5	5	54.7	.7096	62.	W.S.W.	155	3	24	1 P	11 A		T.	
6	6	51.3	.6589	59.3	N.W.	234	$4\frac{1}{4}$	29	3-30 P	6-30 A	10 A	T.	
7	1	55.7	.6422	70.	W.	106	$\frac{1}{4}$	7	8 P	11 A	12 P		
8	2	56.7	.6719	61.7	N.N.W.	117	3	24	9 P	0 A	2 A	1.06	
9	3	57.7	.7232	67.	N.N.E.	147	$2\frac{1}{4}$	21	7-30 A	12-30 P	4 P	T.	
10	15	56.	.8076	59.7	N.	73	$\frac{1}{2}$	10	9 A				
11	15	54.3	.8011	56.	S.S.W.	106	$1\frac{1}{4}$	16	4 P				
12	13	57.3	.8605	56.	S.S.W.	81	$\frac{1}{4}$	7	2 P				
13	14	62.7	.9927	62.7	S.W.	120	$1\frac{1}{2}$	17	1 P				
14	12	68.7	1.0620	67.7	S.S.W.	209	2	20	1 P				
15	5	69.	.9233	77.7	S.W.	234	4	28	1-30 P	3 P	8 P	.14	
16	11	61.	.8653	64.3	W.	117	$2\frac{1}{2}$	22	1 P				
17	15	58.	.9030	55.3	S.S.E.	41	0						
18	1	62.3	.7583	74.3	N.W.	96	$2\frac{1}{2}$	22	10 P	1-30 P	10-30 P	1.11	
19	5	64.3	.9333	66.	E.N.E.	199	$2\frac{1}{4}$	21	3-30 A				
20	4	62.7	.8510	70.	N.	47	$\frac{1}{4}$	7	3 P				
21	8	59.3	.8529	64.	S.	106	$2\frac{1}{2}$	22	10 A				
22	13	57.	.8039	58.7	N.	83	$1\frac{1}{4}$	16	6 P				
23	6	57.	.7588	63.3	N.	222	$2\frac{1}{2}$	22	1 P				
24	1	66.	.8906	73.3	N.N.E	157	$\frac{1}{4}$	7	2 P	7 A	9 P	.47	
25	8	60.3	.7947	65.3	N.W.	57	$1\frac{1}{4}$	16	2 P	12 M	1-30 P	.04	
26	13	52.	.6658	60.7	S.S.W.	63	$\frac{1}{2}$	10	0 A				
27	12	48.	.6210	57.7	N.W.	106	1	14	12 M				
28	8	56.3	.6566	70.	S.W.	143	$2\frac{1}{2}$	22	1 P	6 P	9 P	T.	
29	0	62.	.7117	79.	S.	116	1	14	6 P	2 A	7-30 P	.47	
30	0	59.3	.6689	81.	S.E.	85	$\frac{1}{2}$	10	1 P	2 P	10-30 P	1.68	
31	14	49.7	.6250	59.7	N.N.E.	203	$4\frac{1}{2}$	30	10 A				

T=trace.

REMARKS.

The temperature was below normal; the rainfall was above the average for forty-nine years. The mean ozone was less than the usual per cent. Six per cent more rain fell at the surface of the ground than at the top of the tower.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No 32. AUGUST, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	29.99, 26th, 7 A.
Actual minimum reading,	29.38, 21st, 5 P.
Mean reduced to sea level,	29.965
Monthly range,	.61

**Air Temperature.* In Degrees Fahr.

Highest,	89; 92.5
Lowest,	53; 45.
Mean,	70.2; 69.
Monthly Range,	36; 47.5.
Highest mean daily,	78.4; 77.3
Lowest mean daily,	61.5; 58.3
Mean maximum,	78. ; 80.4
Mean minimum,	62.4; 57.7
Mean daily range,	15.6; 22.7
Greatest daily range,	24. ; 34.5
Least daily range,	3; 10.5

Humidity.

Mean dew point,	62.4
Mean force of vapor,	.8417
Mean relative humidity,	70.3

Wind.

Prevailing Directions.

North,	23 per cent.
South,	14 " "
South West,	14 " "
South South West,	11 " "
Other directions,	38 " "
Total movement,	3324 m.
Greatest daily movement,	292 m., 21st
Least daily movement,	32m., 9th
Mean daily movement,	107.2 m.
Mean hourly velocity,	4.5 m.

Maximum pressure per square foot, $2\frac{1}{2}$ lbs.= 22 m. per hour, 13th, at 11 A. and 24 at 7 P.

**Precipitation.* In inches.

Total precipitation,	3.43; 4.18

Weather.

Mean cloudiness observed,	58 per cent.
Number of clear days,	10
Number of cloudy days,	12
Number of fair days,	9

Total cloudiness recorded by the Sun Thermometer, 226 hours or 52 per cent.

Number of days on which .01 inch or more rain fell,	11

Bright Sunshine.

Number of Hours recorded,	201

Rain. 1st, 2d, 4th, 5th, 6th, 7th, 9th, 12th, 15th, 18th, 21st, 22d, 23d, 24th, 26th, 27th, 28th, 30th, 31st.

Thunder and Lightning. 7th, 12th, 18th, 23d, 28th.

Mean Ozone,	26 per cent.

Halos.

Solar,	1st, 7th, 26th, 29th.
Lunar coronae,	14th, 16th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.895	29.67	29.745	75.	78.	2 P	53.	45.	4 A	66.	30
2	29.82	29.68	29.713	79.	79.	5 P	64.	59.	4 A	68.6	40
3	30.03	29.82	29.958	79.	82.	4 P	57.	47.5	5 A	68.3	30
4	30.13	30.03	30.09	70.	73.	11 A	61.	55.5	5 A	64.3	40
5	30.16	30.12	30.143	75.	76.	3 P	61.	59.	3 A	66.4	30
6	30.14	30.075	30.118	77.	80.	4 P	63.	60.	5 A	69.7	30
7	30.11	29.94	30.012	83.	85.5	3 P	61.	53.	4 A	73.	30
8	29.97	29.90	29.932	83.	85.5	3 P	64.	58.5	12 P	73.7	50
9	30.00	29.91	29.965	75.	73.	11 A	57.	49.	5 A	69.	20
10	29.97	29.88	29.925	85.	84.	3 P	67.	60.5	3 A	76.1	00
11	30.00	29.825	29.915	89.	92.5	2 P	68.	62.	5 A	78.4	30
12	29.85	29.79	29.832	83.	86.5	12 M	67.	67.5	12 P	76.6	00
13	29.99	29.85	29.932	79.	83.	5 P	60.	52.	5 A	70.3	20
14	30.04	29.99	30.017	82.	83.5	4 P	63.	56.5	4 A	71.4	20
15	30.03	29.905	29.947	75.	76.	3 P	65.	62.	12 P	69.4	20
16	30.05	29.98	30.012	79.	81.	5 P	62.	58.5	7 A	69.3	30
17	30.07	30.01	30.037	82.	84.	4 P	61.	56.5	6 A	71.	20
18	30.04	29.815	29.878	78.	81.5	11 A	62.	56.	12 P	69.6	00
19	30.01	29.85	29.94	80.	82.	4 P	60.	56.5	2 A	68.9	20
20	30.02	29.90	29.963	78.	81.	2 P	58.	54.	5 A	69.	20
21	29.90	29.655	29.707	76.	78.	3 P	69.	66.5	1 A	72.5	20
22	29.88	29.66	29.788	85.	85.	6 P	69.	64.	12 P	76.1	20
23	29.92	29.845	29.887	85.	87.	3 P	61.	54.5	5 A	73.8	10
24	29.945	29.87	29.907	83.	87.	4 P	71.	66.	3 A	75.6	30
25	30.20	29.945	30.102	81.	84.	3 P	67.	65.	12 P	75.1	20
26	30.27	30.17	30.255	74.	77.	1 P	63.	59.5	6 A	68.3	30
27	30.17	29.92	30.028	75.	78.5	12 M	66.	64.	6 A	71.	20
28	29.92	29.76	29.83	76.	82.5	4 P	63.	63.	12 P	71.6	30
29	30.14	29.88	30.042	69.	72.	4 P	56.	50.	6 A	61.5	50
30	30.19	30.04	30.177	60.	63.5	3 P	57.	53.	3 A	58.6	40
31	30.21	30.15	30.18	67.	70.	2 P	58.	55.	4 A	61.8	50

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	6	54.7	.7259	59.7	S.S.W.	155	1¼	16	11-30 A	6 P	10 P	T.	
2	4	60.	.7812	68.7	N.	90	0			7 A		T.	
3	14	58.7	.8563	60.	N.	69	0						
4	0	61.7	.6095	91.7	N.	99	1¼	16	4 P	7 A	7-30 P	.25	
5	1	61.	.7553	74.	N.	61	0			7 A	9 P	T.	
6	7	60.3	.8043	68.	S.	48	¼	7	2 P	0 A	2 A	.02	
7	10	64.	.9817	63.3	S.S.W.	98	0			9-30 P	10 P	T.	
8	14	61.3	.9548	60.3	N.	91	½	10	4-30 P				
9	3	64.3	.8230	74·3	S.	32	0			12 M		T.	
10	12	65.7	1.0178	66.7	W.	105	½	10	3 P				
11	14	68.	1.1225	65.	S.	71	1½	17	6 P				
12	7	67.7	.9975	68.7	S.W.	111	¼	7	11 A	1 P	5 P	.04	
13	13	59.	.8434	55.	N.N.E.	108	2½	22	11 A				
14	7	62.	.8493	69.7	S.S.W.	56	¼	7	6 P				
15	3	64.	.7938	76.7	S.	152	½	10	7 A	2 A	4 P	.39	
16	11	61.3	.8161	69.3	N.	84	0						
17	12	60.3	.8474	65.7	N.	54	0						
18	5	63.	.7884	75.3	S.W.	118	2	20	11 A	1-30 P	8-30 P	.17	
19	7	62.	.8287	69.	N.	90	½	10	5 A				
20	9	61.7	.8252	70.	S.W.	136	2	20	12 P				
21	0	68.3	.8994	77.7	S.W.	292	2¼	21	2-30 P	11 P	12 P		
22	13	67.	.9283	73.7	W.N.W.	151	¾	12	1-30 A	0 A	3-30 A	1.23	
23	11	64.3	.9713	69.	S.W.	53	¾	12	11 P	9-30 P	11-30 P	.34	
24	3	69.7	1.0515	70.3	S.W.	188	2½	22	7 P	10-30 A	12 M	T.	
25	8	62.3	.9531	63.	S.W.	176	1	14	1-30 P				
26	1	61.7	.7675	73.7	N.	52	0			3 P	12 P		
27	0	68.3	.8625	81.	S.S.E.	85	¾	12	8 P	0 A	12 P		
28	2	66.7	.8748	76.7	S.S.W.	157	¾	12	5 P	0 A	5-30 P	1.74	
29	7	57.7	.5891	74.	N.W.	122	1	14	1-30 A				
30	0	54.	.5503	76.3	N.E.	84	0			9 A	1 P	T.	
31	0	55.	.6214	72.	N.N.E.	139	½	10	1 A	6 P	8 P	T.	

T=trace.

REMARKS.

The temperature was above normal; the rainfall was below the average for forty-nine years. The mean ozone was less than the usual per cent. Seventeen per cent more rain fell at the surface of the ground than at the top of the tower.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 33. SEPTEMBER, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.16, 30th, 12 P.
Actual minimum reading,	29.44, 7th, 3 P.M.
Mean reduced to sea level,	30.115
Monthly range,	.72

****Air Temperature.*** In Degrees Fahr.

Highest,	86; 91.5
Lowest,	43; 36.
Mean,	65.3; 64.9
Monthly Range,	43; 55.5.
Highest mean daily,	74.2; 75.5
Lowest mean daily,	55.8; 52.8
Mean maximum,	72.4; 76.9
Mean minimum,	56.8; 52.9
Mean daily range,	15.6; 24.
Greatest daily range,	27. ; 39.
Least daily range,	5; 11.

Humidity.

Mean dew point,	58.1
Mean force of vapor,	.7010
Mean relative humidity,	72.1

Wind.

Prevailing Directions.

South South West,	17 per cent.
North,	13 " "
South West,	12 " "
South South East,	11 " "
Other directions,	47 " "
Total movement,	3201 m.
Greatest daily movement,	218 m., 30th
Least daily movement,	44 m., 2d.
Mean daily movement,	106.7 m.
Mean hourly velocity,	4.5 m.

Maximum pressure per square foot, 4 lbs.= 28 m. per hour, 30th, at 4 P. M.

****Precipitation.*** In inches.

Total precipitation,	1.78; 2.66

Weather.

Mean cloudiness observed,	50 per cent.
Number of clear days,	18
Number of cloudy days,	7
Number of fair days,	5

Total cloudiness recorded by the Sun Thermometer, 151 hours or 34 per cent.

Number of days on which .01 inch or more rain fell, . . . 7

Bright Sunshine.

Number of Hours recorded, . . . 224

Rain, 1st, 5th, 6th, 13th, 15th, 17th, 21st, 27th, 29th.

Aurora, 9th, 10th, 11th.

Thunder and Lightning, 6th, 13th, 26th, 29th.

Mean Ozone, . . . 45 per cent.

Halos.

Solar,	3d, 11th, 15th.
Lunar,	11th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.21	30.11	30.143	66.	68.5	2 P	59.	56.5	4 A	62.3	40
2	30.12	30.055	30.097	75.	79.5	3 P	58.	53.5	5 A	65.2	10
3	30.15	30.08	30 127	74.	78.	4 P	52.	47.	6 A	63.5	40
4	30.16	30.04	30.093	78.	81.5	2 P	66.	62.5	1 A	71.2	40
5	30.27	30.16	30.215	63.	70.	3 P	56.	54.	11 P	61.7	40
6	30.185	29.98	30.055	60.	64.	4 P	55.	53.	4 A	58.	50
7	29.98	29.72	29.827	69.	73.5	4 P	61.	52.5	1 A	63.3	20
8	30.15	29.89	30.042	66.	69.	4 P	51.	47.	12 P	68.4	40
9	30.275	30.15	30.21	66.	69.5	4 P	43.	36.	6 A	55.8	40
10	30.36	30.275	30.333	73.	78.	3 P	48.	41.5	5 A	61.5	50
11	30.375	30.265	30.325	75.	79.5	2 P	50.	43.5	6 A	63.8	10
12	30.285	30.10	30.193	73.	76.5	2 P	54.	48.	5 A	64.4	10
13	30.10	29.81	29.915	74.	77.5	2 P	60.	56.	4 A	66.8	50
14	29.935	29.79	29.84	69.	73.5	1 P	55.	54.	12 P	63.3	20
15	30.015	29.92	29.97	65.	69.	2 P	49.	42.5	5 A	58.6	40
16	30.255	29.94	30.137	69.	73.5	5 P	56.	53.	12 P	61.8	40
17	30.37	30.23	30.287	70.	75.	4 P	49.	43.	6 A	60.9	20
18	30.23	29.88	30.017	86.	91.5	2 P	64.	59.5	1 A	74.2	70
19	30.205	29.92	30.087	75.	80.	4 P	56.	57.	12 P	68.9	70
20	30.24	30.10	30.23	73.	79.	3 P	48.	41.	6 A	61.9	80
21	30.12	30.01	30.067	80.	86.	4 P	53.	47.	7 A	67.4	60
22	30.16	30.07	30.113	71.	73.5	2 P	65.	59.5	4 A	68.4	80
23	30.14	30.01	30.06	79.	85.	4 P	66.	64.	7 A	71.4	60
24	30.22	30.14	30.193	72.	76.	3. P	64.	61.	5 A	67.8	70
25	30.17	29.98	30.057	79.	86.	2 P	60.	62.	4 A	71.1	50
26	30.22	30.00	30.113	82.	87.5	3 P	66.	60.5	6 A	72.5	50
27	30.28	30.195	30.242	75.	79.	3 P	65.	60.5	5 A	69.5	60
28	30.27	30.19	30.227	78.	82.	4 P	67.	64.	3 A	71.2	50
29	30.19	29.955	30.048	75.	81.	2 P	61.	61.	12 P	68.2	40
30	30.45	30.12	30.193	61.	64.5	3 P	47.	46.	12 P	55.8	50

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	0	59.3	.6328	80.	N.	74	0			7 A	5 P	.03	
2	13	58.	.6959	74.	N.N.W.	44	0						
3	2	58.7	.7211	71.	S. S. W.	89	$\frac{1}{2}$	10	7 P				
4	8	63.	.8615	70.	S. S. W.	141	$\frac{3}{4}$	12	1-30 P				
5	0	56.7	.5587	83.	N. E.	133	$\frac{1}{4}$	7	1 P	9 A	12 P		
6	0	58.7	.5516	89.3	N.	82	0			0 A	6 P	.71	
7	5	58.7	.6478	77.7	N. N. E.	132	$2\frac{3}{4}$	23	4-30 P				
8	7	51.3	.5281	74.	N.	98	$\frac{1}{4}$	7	11 A				
9	12	45.3	.4941	65.3	N. W.	86	1	14	11 A				
10	13	53.7	.6410	67.3	S.W.	47	0						
11	13	56.	.6793	69.3	S. S. W.	74	$\frac{1}{4}$	7	2 P				
12	8	57.	.6861	72.	S. S. W.	112	$\frac{1}{4}$	7	2 P				
13	4	63.3	.7739	78.	S. S. W.	176	1	14	6 P	7-30 P	12 P	.26	
14	5	52.7	.6343	64·7	N.	153	$1\frac{1}{4}$	16	4 P				
15	12	49.7	.5626	65.	W.	78	1	14	1-30 P	6 P	7 P	T.	
16	7	55.7	.6306	73.3	N.	108	$\frac{1}{4}$	7	1 P				
17	8	55.3	.5971	77.	S.	83	$1\frac{1}{4}$	16	12 M	11-45 A		.03	
18	9	63.3	1.0059	62.3	S. W.	147	2	20	3 P				
19	12	56.	.7595	60.7	N. N. E.	151	$2\frac{1}{2}$	22	8 A				
20	12	55.3	.6527	71.7	S· S. W.	70	$\frac{1}{4}$	7	4 P				
21	12	60.	.7788	71.7	S. W.	62	0			11 P	12 P	.02	
22	0	64.7	.8056	76.3	S.	48	0						
23	11	63.7	.9001	68.	N.	117	$1\frac{1}{2}$	17	6 A				
24	3	63.	.7567	77.7	S.W.	145	$\frac{1}{2}$	7	2 A				
25	9	67.3	.9156	75.3	S .W.	108	1	14	2 A				
26	7	62.	.8933	66.	N.	47	0						
27	9	63.	.5704	70.3	S.S.W.	83	0			9 P		T.	
28	9	67.3	.8843	77.7	S.S.W.	122	$\frac{3}{4}$	12	1 P				
29	2	61.7	.7698	72.3	S.W.	173	3	24	4 P	7 A	4-30 P	1.61	
30	12	41.3	.4386	62.	N.	218	4	28	4 P				

T=trace.

REMARKS.

The temperature was above normal and the rain fall was below the average for forty-nine years. The mean ozone was less than the usual per cent. Thirty-three per cent more rain fell at the surface of the ground than at the top of the tower.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 34. **OCTOBER, 1891.**

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.37, 12th, 8 A.
Actual minimum reading,	29.29, 5th, 1 P.M.
Mean reduced to sea level,	30.028
Monthly range,	1.08

**Air Temperature.* In Degrees Fahr.

Highest,	82; 89.
Lowest,	27; 20.
Mean,	49.9; 48.7
Monthly Range,	55; 69.
Highest mean daily,	68.6; 72.
Lowest mean daily,	37; 35.
Mean maximum,	57.1; 61.3
Mean minimum,	41.8; 36.2
Mean daily range,	15.3; 25.1
Greatest daily range,	26.; 38.
Least daily range,	5; 11.5

Humidity.

Mean dew point,	40.6
Mean force of vapor,	.4063
Mean relative humidity,	65.5

Wind.

Prevailing Directions.

North,	19 per cent.
North North East,	13 " "
South West,	13 " "
South	11 " "
Other directions,	44 " "
Total movement,	4319 m.
Greatest daily movement,	420 m., 23d.
Least daily movement,	11m., 4th.
Mean daily movement,	139.3 m.
Mean hourly velocity,	5.8 m.

Maximum pressure per square foot, 9½ lbs.= 39 m. per hour, 22d, at 11 P.M.

**Precipitation.* In inches.

Total precipitation,	2.22; 2.94

Weather.

Mean cloudiness observed,	54 per cent.
Number of clear days,	7
Number of fair days,	14
Number of cloudy days,	10
Total cloudiness recorded by the Sun Thermometer,	193 hours or 56 per cent.
Number of days on which .01 inch or more rain fell,	7

Bright Sunshine.

Number of Hours recorded,	150

Rain. 7th, 8th, 13th, 14th, 16th, 20th, 22d, 26th, 27th.

First Frost,	10th.
Thunder and Lightning,	20th.
Rainbow,	20th.
Mean Ozone,	33 per cent.

Halos.

Solar,	12th.
Lunar,	12th.
Coronae,	11th, 12th, 15th, 19th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.54	30.435	30.482	64.	69.5	4 P	41.	35.5	6 A	53.1	50
2	30.44	30.21	30.297	69.	72.5	4 P	46.	39.	3 A	57.6	60
3	30.21	29.94	30 055	79.	86.	4 P	53.	48.	7 A	65.1	50
4	29.94	29.69	29.78	82.	89.	5 P	60.	55.	4 A	68.6	20
5	29.845	29.56	29.697	77.	83.5	2 P	56.	53.5	12 P	64.2	10
6	30.19	29.835	30.092	60.	64.5	2 P	49.	43.	7 A	54.2	30
7	30.23	29.91	30.137	51.	54.	3 P	45.	42.	7 A	48.4	50
8	29.91	29.68	29.737	59.	64.5	2 P	49.	46.5	1 A	53.2	60
9	30.08	29.85	30.00	59.	64.5	4 P	42.	39.	12 P	50.8	50
10	30.12	30.02	30.063	62.	62.5	3 P	38.	31.	4 A	49.8	30
11	30.54	30.04	30.26	58.	62.	12 M	37.	35.	12 P	47.7	10
12	30.67	30.53	30.613	48.	51.	2 P	33.	28.	6 A	40.5	50
13	30.53	30.00	30.26	45.	47.5	1 P	40.	36.	2 A	41.6	40
14	30.00	29.87	29.898	57.	63.	2 P	41.	38.	1 A	50.9	60
15	29.91	29.80	29.872	60.	64.	4 P	51.	48.	12 P	54.7	20
16	30.22	29.89	30.063	53.	57.5	12 M	43.	34.5	12 P	48.6	10
17	30.37	30.22	30.318	58.	64.5	4 P	36.	27.	6 A	47.9	10
18	30.36	30.18	30.287	57.	60.	2 P	37.	30.5	5 A	47.8	20
19	30.18	29.985	30.048	54.	61.	1 P	40.	35.5	3 A	48.6	50
20	30.00	29.64	29.767	53.	56.5	3 P	47.	43.	4 A	48.8	50
21	29.88	29.64	29.75	53.	57.	1 P	45.	41.	3 A	49.1	40
22	29.90	29.75	29.853	51.	51.	2 P	41.	39.	11 P	46.1	20
23	29.75	29.63	29.657	44.	46.5	1 P	37.	27.5	8 P	40.5	40
24	29.84	29.63	29.707	48.	49.5	2 P	37.	28.	1 A	42.1	30
25	29.96	29.84	29.942	51.	55.	3 P	32.	24.	7 A	40.8	10
26	29.96	29.63	29.72	57.	61.	4 P	38.	28.	1 A	49.3	40
27	29.94	29.58	29.737	46.	52.5	1 P	38.	35.	12 P	45.4	30
28	30.32	29.94	30.172	41.	44.	2 P	33.	26.	10 P	37.	30
29	30.47	30.32	30.407	48.	50.5	4 P	27.	20.	6 A	48.3	0
30	30.38	30.12	30.212	61.	66.	4 P	37.	28.5	7 A	49.9	10
31	30.125	29.755	29.94	66.	69.	2 P	47.	37.5	7 A	57.5	30

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	11	43.	.4353	69.7	N.	82	$\frac{1}{4}$	7	5 A				
2	7	53.	.5726	74.7	S.W.	51	0						
3	7	60.3	.7433	76.7	S. W.	27	$\frac{1}{4}$	7	12 M				
4	8	63.	.8429	72.7	S.W.	11	0						
5	6	54.7	.6846	68.3	N.N.W.	98	$1\frac{3}{4}$	19	5-30 P				
6	7	38.7	.4549	54.3	N.	157	$\frac{1}{2}$	10	10 A				
7	0	43.3	.3539	80.3	N. N. E.	115	$\frac{1}{4}$	7	7 A	†– A	12 P		
8	7	46.7	.4340	75.3	N.	169	$2\frac{1}{4}$	21	11-30 P	0 A	9 A	.67	
9	8	43.	.3870	73.3	N. N. E.	126	2	20	4 A				
10	3	41.	.4148	69.3	E. N. E.	40	$\frac{1}{4}$	7	10 A				
11	4	36.	.3251	68.	N .N. E.	144	7	38	6-30 P				
12	4	28.	.2713	61.3	E.	239	$2\frac{1}{2}$	22	4 A				
13	0	34.7	.2748	75.	N.	159	$2\frac{1}{2}$	22	9 P	1 P	12 P		
14	2	47.	.4404	73.7	N.	182	$\frac{1}{2}$	10	1 P	0 A	2 A	.86	
15	2	48.	.4783	72.7	S. S. W.	83	$\frac{3}{4}$	12	1 P				
16	5	39.3	.3417	71.3	N. W.	115	$1\frac{1}{2}$	17	1 P	1 P		T.	
17	11	38.7	.3540	71.3	S. S. E.	73	$3\frac{1}{4}$	25	9 A				
18	2	41.7	.4177	67.7	S.	97	$\frac{1}{2}$	10	8 P				
19	1	45.	.3837	73.3	N. N. E.	102	1	14	10 A				
20	0	45.7	.3706	84.3	E.	116	$2\frac{1}{2}$	22	11-30 A	5 A	4 P	1.28	
21	4	41.	.3661	70.7	S. W.	224	$6\frac{3}{4}$	37	1 P				
22	2	36.7	.3373	66.7	N. N. E.	119	$7\frac{1}{2}$	39	11 P	12-30 A		T.	
23	5	25.3	.2504	56.3	N.	420	$7\frac{1}{4}$	38					
24	6	24.7	.2643	53.	N.	220	7	37					
25	9	22.	.2627	49.3	N.W.	105	$\frac{1}{2}$	10					
26	2	45.3	.4303	72.	S.S.W.	131	1	14		7 P	12 P		
27	0	37.3	.2977	75.	N.N.W.	175	$3\frac{3}{4}$	27	2 P	0 A	7 P	.13	
28	6	25.	.2133	65.3	N.	242	$4\frac{1}{2}$	30	10 P				
29	9	27.7	.2416	66.7	S.	126	1	14	3 P				
30	8	38.7	.4292	61.7	S.S.W.	171	$\frac{1}{2}$	10	2 P				
31	4	45.	.5216	60.7	S.S.W.	223	$2\frac{1}{4}$	21	4-30 P				

†Early morning. T=trace.

REMARKS.

The temperature was above normal and the rain fall was below the average for forty-nine years. The mean ozone was less than the usual per cent. Twenty-four per cent more rain fell at the surface of the ground than at the top of the tower. A light frost, the first of the season occurred on the 10th. On the 12th the first heavy frost occurred.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 35. NOVEMBER, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.44, 19th, 10 A.
Actual minimum reading,	28.90, 23rd, 9 P.
Mean reduced to sea level,	30.117
Monthly range,	1.54

**Air Temperature.* In Degrees Fahr.

Highest,	60; 64.
Lowest,	8; 3.5
Mean,	39.7; 38.1
Monthly Range,	52; 60.5
Highest mean daily,	55.8; 53.9
Lowest mean daily,	17.7; 15 5
Mean maximum,	46.3; 49.7
Mean minimum,	32.7; 26.6
Mean daily range,	13.6; 23.1
Greatest daily range,	24.; 39.
Least daily range,	7; 13.

Humidity.

Mean dew point,	30.4
Mean force of vapor,	.2839
Mean relative humidity,	68.7

Wind.

Prevailing Directions.

South	18 per cent.
North West,	14 " "
North,	13 " "
South West,	11 " "
Other directions,	44 " "
Total movement,	5215 m.
Greatest daily movement,	382 m., 17th.
Least daily movement,	36m., 4th.
Mean daily movement,	173.8 m.
Mean hourly velocity,	7.2 m.

Maximum pressure per square foot, 15¾ lbs.= 56 m. per hour, 17th, at 2 P.M.

**Precipitation.* In inches.

Total precipitation,	1.44; 2.99

Weather.

Mean cloudiness observed,	50 per cent.
Number of clear days,	12
Number of fair days,	7
Number of cloudy days,	11
Total cloudiness recorded by the Sun Thermometer,	153 hours or 52 per cent.
Number of days on which .01 inch or more rain fell,	8

Bright Sunshine.

Number of Hours recorded,	141

Rain, 10th, 11th, 16th, 17th, 23d, 26th, 27th, 28th.

Snow,	26th, 28th.
Mean Ozone,	42 per cent.

Halos.

Solar,	21st.
Lunar,	19th.
Coronae,	13th, 17th.

Gales, of 40 or more miles or more per hour, 56, 17th, S. W.; 48, 23d, S.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
DAY.	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	29.97	29.735	29.84	52.	61.	12 M	44.	39.	9 P	49.3	10
2	30.22	29.97	30.133	41.	44.5	1 A	32.	26.	8 A	36.9	20
3	30.36	30.22	30 32	39.	44.5	3 P	26.	17.	7 A	32.	30
4	30.31	30.21	30.257	40.	45.	4 P	21.	12.5	7 A	30.5	20
5	30.21	30.08	30.127	42.	44.	3 P	28.	21.	1 A	34.5	30
6	30.12	30.09	30.107	46.	53.	3 P	32.	26.5	7 A	38.4	40
7	30.12	30.00	30.053	53.	58.	4 P	33.	27.	6 A	42.1	40
8	30.055	30.02	30.04	55.	62.	3 P	31.	23.	7 A	42.2	50
9	30.21	30.06	30.172	52.	55.	3 P	36.5	27.	5 A	43.6	40
10	30.23	30.15	30.20	55.	56.	3 P	47.	42.5	1 A	51.3	50
11	30.15	29.79	29.893	60.	64.	7 A	46.	42.	12 P	55.8	40
12	29.98	29.87	29.923	54.5	59.5	3 P	37.	33.	6 A	45.3	50
13	30.33	29.98	30.177	47.	52.5	2 P	37.	28.5	12 P	42.	50
14	30.45	30.33	30.383	47.	48.	2 P	31.	23.	6 A	38.4	60
15	30.645	30.45	30.617	40.	44.	3 P	31.	24.	7 A	35.	50
16	30.64	30.145	30.42	55.	53.5	12 M	35.	27.5	1 A	41.9	50
17	30.145	29.46	29.733	60.	63.5	11 A	38.	34.	12 P	51.3	40
18	30.59	29.77	30.29	33.	38.5	1 P	26.	21.5	12 P	31.8	60
19	30.74	30.59	30.702	38.	40.	1 P	22.	15.	3 A	30.	50
20	30.69	30.53	30.572	46.	50.	1 P	32.	25.	1 A	38.4	40
21	30.55	30.38	30.477	49.	49.	2 P	32.	25.5	3 A	41.3	30
22	30.38	30.04	30.207	53.	56.	3 P	43.	35.	2 A	48.9	40
23	30.04	29.18	29.547	58.	61.	3 P	50.5	46.5	1 A	54.8	30
24	29.66	29.22	29.49	49.	55.	10 A	39.	37.	12 P	46.9	40
25	29.92	29.66	29.882	45.	41.5	3 P	36.	28.5	7 A	39.4	30
26	30.07	29.88	30.043	37.	38.5	1 P	30.	21.5	7 A	34.	50
27	29.88	29.675	29.678	40.	44.5	1 P	33.	29.5	1 A	37.3	60
28	29.97	29.67	29.72	51.	53.	2 P	29.	25.	12 P	41.3	50
29	30.30	29.97	30.237	28.	28.	1 A	14.	11.	12 P	19.2	60
30	30.305	30.23	30.263	24.	27.5	2 P	8.	3.5	7 A	17.7	60

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	2	27.3	.3233	46.	N. W.	307	7½	39	5 P				
2	10	20.3	.2056	58.	N.W.	227	3½	26	0 A				
3	9	19.7	.1695	66.	N.N.W.	108	1¼	16	11 A				
4	10	20.7	.1843	65.3	W.	36	0						
5	1	26.7	.2117	71.	N.	109	½	10	3 P				
6	10	27.3	.2409	66.	N.	226	2¼	21	1 P				
7	10	28.7	.2867	62.7	N.	241	3	24	9 A				
8	10	31.3	.4023	62.7	N.W.	54	0						
9	8	39.3	.3471	71.3	S. S. W.	75	½	10	8 P				
10	0	48.3	.4471	76.7	S.	206	1½	17	11 P	8-30 P	12 P		
11	0	53.3	.5149	82.	W.	326	2½	22	2 A	0 A	5 P	.72	
12	4	42.	.3459	80.3	N.N.W.	55	¾	12	6 P				
13	8	30.7	.2768	63.7	N.N.W.	97	1	14	3 P				
14	3	27.7	.2778	67.3	N.	94	1½	17	1 P				
15	10	27.	.1999	75.3	N. W.	84	¼	7	11 A				
16	0	39.3	.3140	77.7	S.S.W.	93	1	14	12 P	12 M	12 P		
17	0	32.7	.4813	58.	S. W.	382	15¾	56	2 P	0 A	7 P	1.20	
18	4	23.	.1606	78.	N.W.	246	3¾	27	11 A				
19	10	22.7	.1780	73.3	S.	147	¾	12	2 P				
20	9	29.3	.2611	69.	S.S.W.	223	1	14	3 P				
21	3	37.	.2927	77.3	S.	76	½	10	10 A				
22	0	45.3	.4048	75.7	S. S. W.	114	1	14	4 P				
23	0	50.	.4464	82.3	S.	364	11¾	48	9 P	1 A	9 P	.57	
24	2	30.	.3234	53.	S.W.	261	4¼	29	12-30 A				
25	4	24.	.2403	55.3	S.W.	157	3½	26	4 P				
26	2	31.7	.2454	75.7	N.	75	¼	7	0 A	4-30 P	12 P		
27	4	29.	.2487	65.7	N.	140	1½	17	2-30 P	0 A	5 A	.48	¼
28	0	32.	.2556	73.7	N.	240	2¼	21	3 P	– A	4-30 P	.02	T.
29	0	5.7	.1277	63.3	N· N. E.	266	4¼	29	11 P				
30	8	8.7	.1036	70.	N. N. E.	186	1¼	16	2 P				

†Early morning. T=trace.

REMARKS.

The temperature was above normal and the rain fall was below the average. The mean ozone was less than the usual per cent. Fifty-two per cent more rain fell at the surface of the ground than at the top of the tower.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 36. DECEMBER, 1891.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading.	30.25, 31st, 9 P.
Actual minimum reading.	29.025, 16th, 7 A.
Mean reduced to sea level,	30.081
Monthly range,	1.225

**Air Temperature.* In Degrees Fahr.

Highest,	56.5; 60.5
Lowest,	14; 9.
Mean,	38.3; 36.9
Monthly Range,	42.5; 51.5
Highest mean daily,	51.; 46.5
Lowest mean daily,	17.8; 18.5
Mean maximum,	45.2; 47.5
Mean minimum,	32.4; 26.3
Mean daily range,	12.8; 21.2
Greatest daily range,	25.5; 31.5
Least daily range,	2; 6.5

Humidity.

Mean dew point,	28.2
Mean force of vapor,	.2483
Mean relative humidity,	68.7

Wind.

Prevailing Directions.

North West,	20 per cent.
South,	18 " "
North,	17 " "
South, South West,	13 " "
Other directions,	32 " "
Total movement,	5465 m.
Greatest daily movement,	390 m., 30th.
Least daily movement,	20m., 21st.
Mean daily movement,	176.3 m.
Mean hourly velocity,	7.3 m.

Maximum pressure per square foot, 14 lbs.= 53 m. per hour, 16th, at 10-30 A.M.

**Precipitation.* In inches.

Total precipitation,	3.62; 5.40

Weather.

Mean cloudiness observed,	51 per cent.
Number of clear days,	12
Number of fair days,	10
Number of cloudy days,	9
Total cloudiness recorded by the Sun Thermometer,	141 hours or 50 per cent.
Number of days on which .01 inch or more rain fell,	10

Bright Sunshine.

Number of Hours recorded,	143

Rain, 4th, 7th, 15th, 16th, 22d, 23d, 24th, 26th, 29th, 30th.

Snow,	16th, 29th.
Hail,	15th.
Mean Ozone,	36 per cent.

Halos.

Solar,	2d, 18th, 19th.
Lunar,	9th, 12th, 19th.
Coronae,	9th, 11th, 14th, 16th.

Gales, of 40 or more miles per hour. 40, 4th, S. W.; 53, 16th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.27	30.23	30.243	43.	47.5	3 P	26.	20.5	1 A	34.6	10
2	30.22	30.06	30.11	47.	51.	3 P	32.	23.	8 A	39.9	10
3	30.26	30.07	30 212	55.	60.5	2 P	38.	29.	12 P	44.7	10
4	30.26	29.45	29.882	56.5	59.5	5 P	36.	28.5	3 A	43.4	20
5	29.995	29.60	29.913	51.	52.	3 P	41.	34.5	8 A	46.4	40
6	29.99	29.84	29.963	53.	54.	3 P	43.	34.	6 A	47.3	50
7	29.85	29.60	29.683	50.	52.	10 A	39.	32.	9 P	45.2	50
8	30.225	29.85	30.172	40.	41.	1 P	31.	25.	7 A	36.3	50
9	30.22	30.12	30.145	50.	52.5	2 P	35.	28.	7 A	41.3	30
10	30.135	30.035	30.082	53.	58.	2 P	40.	31.5	1 A	45.2	0
11	30.23	30.04	30.133	49.	48.	2 P	40.	33.5	12 P	44.2	10
12	30.29	30.12	30.187	48.	49.	2 P	35.	25.	6 A	41.6	20
13	30.12	29.92	30.00	55.	55.5	2 P	36.	29.	7 A	45.2	30
14	30.22	29.96	30.052	49.	52.5	12 M	37.	31.	11 P	44.3	50
15	30.29	29.635	30.063	36.	38.	1 A	29.	24.5	10 A	31.1	40
16	29.635	29.33	29.427	43.	41.	1 P	28.	25.	12 P	34.2	50
17	30.285	29.625	29.945	27.	30.	1 A	14.	9.	5 P	17.8	40
18	30.52	30.285	30.452	30.	34.	3 P	14.	10.	1 A	21.	40
19	30.44	30.36	30.373	37.	41.	4 P	22.	17.	8 A	30.	50
20	30.44	30.39	30.412	37.	37.5	3 P	27.	20.5	7 A	32.8	30
21	30.43	30.38	30.397	44.	50.5	2 P	33.	27.	12 P	37.6	20
22	30.40	30.17	30.262	48.	49.	12 P	33.	25.	1 A	41.3	30
23	30.17	29.885	29.988	54.	52.5	5 P	48.	36.	1 A	51.	40
24	30.07	29.92	30.047	51.	52.5	1 A	40.	36.	6 P	43.5	80
25	30.11	30.07	30.097	41.	43.5	2 P	39.	37.	7 A	40.3	80
26	30.11	29.53	29.78	52.	54.5	8 P	40.	38.5	12 P	45.1	30
27	29.995	29.57	29.858	39.	42.5	1 A	31.	26.	12 P	34.9	50
28	30.34	29.995	30.242	36.	38.5	3 P	25.	19.5	12 P	29.5	40
29	30.34	29.75	30.113	48.	49.5	11 P	22.	18.	5 A	34.8	40
30	30.08	29.66	29.787	48.5	51.	1 A	28.	25.5	12 P	39.5	40
31	30.55	30.08	30.497	30.	33.5	2 P	21.	16.	12 P	24.5	30

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	9	26.7	.2117	71.	S.	74	$\frac{1}{4}$	7	6 A				
2	7	33.7	.2699	75.7	S. S. W.	171	$\frac{1}{4}$	7	3 A				
3	8	37.7	.3485	67.	S.S.E.	44	$\frac{1}{4}$	7	12-30 A				
4	0	39.	.2838	84.7	S.	193	8	40	10 P	8-30 A	9 P	1.06	
5	9	29.	.3115	54.7	S. W.	260	$4\frac{1}{2}$	30	1 A				
6	5	32.7	.3349	58.	N.W.	218	$1\frac{1}{2}$	17	11 A				
7	0	33.	.2908	66.3	N. W.	246	2	20	11-30 A	† – A	12 M	.12	
8	5	19.7	.2016	56.7	S.	168	$1\frac{1}{2}$	17	3 P				
9	4	21.7	.3051	41.	S.W.	228	$1\frac{1}{4}$	16	12-30 A				
10	9	32.	.3352	57.	S.S.E.	135	$\frac{1}{4}$	7	11 A				
11	5	30.3	.2945	59.3	N.W.	137	$2\frac{1}{2}$	22	2 A				
12	8	22.3	.2577	52.7	W.	180	$2\frac{1}{2}$	22	1 P				
13	9	27.3	.3101	54.7	W.	192	5	32	3 P				
14	2	30.3	.2999	57.7	W.S.W.	172	$1\frac{1}{2}$	17	7 P				
15	0	27.	.1686	88.	N.	133	$3\frac{1}{2}$	26	2 A	8 A	12 P		T
16	5	20.	.1935	63.	N.W.	188	14	53	10-30 A	0 A	8 A	.42	
17	6	1.3	.0838	57.7	N.W.	297	$4\frac{1}{4}$	29	1 A				
18	9	21.	.1430	85.3	N.	146	$1\frac{1}{4}$	16	1 A				
19	9	23.3	.1765	75.3	N.	72	$\frac{1}{4}$	7	9 P				
20	4	27.	.1963	76.3	N.W.	59	0						
21	5	33.	.2424	78.	S.S.W.	20	0						
22	0	39.	.3071	78.	S .S. W.	168	$1\frac{1}{2}$	17	5 P	5 P	12 P		
23	0	48.3	.3879	88.3	S. S. W.	261	2	20	5 P	0 A	12 P		
24	0	39.3	.2704	88.3	N.	132	$\frac{1}{2}$	10	3 P	0 A	10 P	1.62	
25	0	31.3	.2313	77.3	N.	129	$\frac{1}{2}$	10	12-30 A				
26	0	41.3	.3081	85.7	S.S.W.	252	$4\frac{1}{2}$	30	7 P	8 A	8 P	.46	
27	3	22.3	.1878	64.3	N.W.	253	$3\frac{3}{4}$	27	4 A				
28	9	21.7	.1540	78.	N.W.	84	$\frac{1}{2}$	10	1 P				
29	0	32.3	.2468	79.	S.	198	$7\frac{1}{4}$	38	9-30 P	10 A	12 P		T
30	4	22.	.2188	57.3	N.W.	390	$7\frac{1}{4}$	38	2-30 P	0 A	5 A	1.72	
31	9	8.7	.1256	54.3	N.	265	$3\frac{1}{2}$	26	1 A				

†Early morning. T=trace.

ANNUAL SUMMARY FOR 1891.

PRESSURE.

In Inches.

Autual max. reading,	30.44, Nov. 19th, 10 A.M.
Actual min. reading,	28.40, Jan. 12th, 6 A.M.
Mean reduced to sea level,	30.018
Annual range,	2.04

AIR TEMPERATURE.

In Degrees Fahr.

Highest,	91.5; 94, June 16th
Lowest,	0.0; -6, Feb. 15th
Mean,	49.7; 49.1
Annual range,	91.5; 100
Highest mean daily,	79.6 Jlne 15, 16; 77.3 Aug. 11
Lowest mean daily,	11.3; 9.3, Mar. 2d
Mean maximum,	57.2; 59.7
Mean minimum,	41.8; 36.7
Mean daily range,	15.4; 23
Greatest daily range,	39; 51.5, May 10th
Least daily range,	2; 6.5, Mar. 9th, Dec. 25th

HUMIDITY.

Mean dew point,	40.1
Mean force of vapor,	.4645
Mean relative humidity,	66.8

WIND.

Prevailing Directions.

North,	19%
South,	13%
North West,	12%
South, South West,	11%
Total movement,	45212 m
Greatest daily movement,	443 m., Mar. 14th
Least eaily movemene,	3 m., Jan. 1st
Mean daily movement,	151.3 m.
Mean hourly velocity,	6.3 m.
Max. pressure per sq. ft.,	16¼ lbs.=57 m. per hr. Jan. 23d at 3 P. M.

PRECIPITATION.

Total rain-fall or melted snow,	34.82 in.; 46.80 in.
Number of days on which .01 inch of rain or melted snow fell,	112
Total snow fall in inches,	54¼ in.

WEATHER.

Mean cloudiness observed,	53%
Total cloudiness recorded by the Sun Thermometer	2220 hrs. or 50%
Number af clear days,	145
Number of fair dnys,	103
Number of cloudy days,	117

BRIGHT SUNSHINE.

Number of hours recorded,	2245
Mean Ozone,	48%

DATES OF FROSTS.

Last,	May 19th
First,	Oct. 12th

DATES OF SNOW.

Last,	May 5th
First,	Nov. 26th

The first figures denote readings at top of tower, the second at base.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 37. JANUARY, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.35, 17th, 10 A.
Actual minimum reading,	28.99, 6th, 10 P.
Mean reduced to sea level,	29.965
Monthly range,	1.36

****Air Temperature.*** In Degrees Fahr.

Highest,	53. ; 57.
Lowest,	0.0; −9.5
Mean,	25.3; 23.6
Monthly Range,	53. ; 66.5
Highest mean daily,	44.6; 44.3
Lowest mean daily,	7. ; 9.9
Mean maximum,	32.1; 34.4
Mean minimum,	18.8; 12.9
Mean daily range,	13.3; 21.5
Greatest daily range,	33.5; 39.5
Least daily range,	3; 7.5

Humidity.

Mean dew point,	18.8
Mean force of vapor,	.1868
Mean relative humidity,	73.7

Wind.

Prevailing Directions.

North North East,	24 per cent.
South West,	18 " "
North,	13 " "
South,	10 " "
Other directions,	35 " "
Total movement,	5059 m.
Greatest daily movement,	306 m., 15th.
Least daily movement,	16m., 18th.
Mean daily movement,	163.2 m.
Mean hourly velocity,	6.8 m.
Maximum pressure per square foot,	10½ lbs.= 46 m. per hour, 26th, at 1-30 P.

****Precipitation.*** In inches.

Total precipitation,	3.77; 5.85

Weather.

Mean cloudiness observed,	63 per cent.
Number of clear days,	8
Number of fair days,	9
Number of cloudy days,	14
Total cloudiness recorded by the Sun Thermometer,	166 hours or 56 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	10
Number of inches of snow on the ground at the close of the month,	2 inches.

Bright Sunshine.

Number of Hours recorded,	128
Rain,	2d, 12th, 13th, 14th, 18th, 19th,
Snow,	3d, 6th, 7th, 8th, 9th, 11th, 15th, 18th, 19th, 23d, 24th, 30th.
Total fall in inches,	13.
Hail,	18th.
Aurora Borealis,	5th.
Mean Ozone,	49 per cent.

Halos.

Solar,	10th.
Lunar,	10th.
Corona,	8th.

Gales, of 40 or more miles per hour, 46, 26th, N. W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.54	30.115	30.308	35.	35.5	9 P	21.	16.	1 A	28.7	60
2	30.115	29.33	29.613	53.	56.	8 P	35.	30.	1 A	44.6	60
3	29.625	29.33	29.52	49.	57.	1 A	29.	26.	12 P	37.1	80
4	29.625	29.54	29.573	28.	32.5	1 A	22.	17.5	8 A	23.9	50
5	29.70	29.56	29.623	28.	30.	1 P	20.	14.5	4 A	23.5	50
6	29.71	29.29	29.513	25.	27.5	2 P	17.5	11.	3 A	21.5	60
7	29.84	29.29	29.513	27.	31.	2 P	24.	17.	7 A	25.3	50
8	30.08	29.84	29.977	26.	28.	2 P	16.	8.	8 A	23.	40
9	30.39	30.08	30.245	27.	28.	2 P	15.	7.5	12 P	20.9	40
10	30.61	30.40	30.56	23.	25.	3 P	3.	–7.5	7 A	14.	30
11	30.61	30.52	30.583	24.	25.5	8 P	18.	12.	1 A	21.5	30
12	30.52	30.32	30.395	32.	33.	12 M	24.	22.	1 A	29.6	70
13	30.32	29.995	30.08	36.	38.	2 P	32.	30.5	1 A	34.3	70
14	30.075	29.83	29.898	53.	57.	2 P	35.	31.5	1 A	44.6	60
15	30.21	30.04	30.13	41.	42.	1 A	25.	20.	12 P	30.	60
16	30.575	30.21	30.435	22.	24.5	3 P	8.	4.5	12 P	17.5	50
17	30.67	30.53	30.593	23.	25.5	4 P	0.0	–9.5	7 A	11.3	40
18	30.53	29.96	30.302	34.	32.5	12 P	13.	6.	6 A	23.8	30
19	29.96	29.72	29.792	36.	37.5	11 A	22.	19.	12 P	30.8	50
20	30.265	29.94	30.203	20.	23.	1 A	5.	0.0	7 A	10.	50
21	30.265	30.06	30.157	24.	29.	2 P	6.	–2.	1 A	16.5	40
22	30.32	29.95	30.178	31.	31.5	12 P	14.	6.	7 A	23.6	50
23	29.95	29.745	29.792	39.	37.5	11 A	30.	19.	12 P	34.3	50
24	29.77	29.55	29.74	29.	32.5	2 P	19.	12.5	8 A	25.6	40
25	29.55	29.35	29.403	42.5	45.5	3 P	28.5	24.	1 A	36.5	40
26	29.695	29.35	29.558	37.	38.	1 A	3.5	–1.5	11 P	13.	40
27	30.075	29.695	29.957	14.	16.	12 M	4.	–2.	1 A	9.9	50
28	30.075	29.86	29.93	28.	28.5	8 P	14.	–1.5	1 A	22.2	50
29	29.86	29.73	29.797	41.	42.5	2 P	28.5	25.5	1 A	24.5	40
30	29.94	29.745	29.907	35.	36.	1 A	28.	25.	12 P	32.7	60
31	29.94	29.905	29.925	34.	37.5	1 P	24.	18.	6 A	29.	30

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
												TOTAL IN INCHES.	
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	SNOW.
1	2	22.7	.1734	72.7	S.W.	34	½	10	6 P				
2	0	44.	.3545	83.7	S. S.E.	235	4½	30	11 P	8-30 A	10 P	1.96	
3	1	23.	.2124	62.	S. W.	154	2	20	1 P	10 A			T.
4	9	10.3	.1179	62.7	N.W.	201	3	24	2-30 P				
5	9	13.7	.1248	70.	S. W.	117	1	14	1 P				
6	0	19.7	.1311	83.7	N.	163	2½	23	2-30 P	9-30 A	12 P		3
7	8	17.7	.1424	71.7	W N.W.	211	3	24	12 M	0 A	7 A	.27	T.
8	8	15.	.1270	73.	S.S.E.	164	½	10	6 P	5 P			T.
9	3	17.3	.1270	80.3	S.W.	59	0			† – A	1 P	.16	2
10	5	6.	.0948	70.3	N.N.E.	38	0						
11	0	16.7	.1286	74.7	N.	220	½	10	2 P	8 A	3 P		T.
12	0	25.7	.1910	84.	N.	118	0			† – A	12 P		
13	0	35.	.2260	89.7	N.	38	0			0 A	12 P		
14	0	40.	.3249	80.	S.W.	153	4½	30	11 A	0 A	1 P	1.89	
15	0	20.3	.1545	74.3	N.N.E.	306	4	28	3 P	† – A	3 P	.46	7
16	8	8.	.0909	74.	N.N.E.	208	1¼	16	0 A				
17	7	10.3	.1061	75.	S.S.W.	47	½	10	4 P				
18	0	24.3	.1569	88.	N.N.E.	16	0		P 4	8-30 A	12 P		T.
19	0	26.3	.1736	84.7	N.N.E.	117	1½	17	12 P	0 A	9 P	1.11	1
20	9	0.0	.0615	74.3	N.N.E.	280	5	32	10-30 A				
21	6	10.3	.1077	70.3	N.W.	121	2	20	2 P				
22	8	19.7	.1508	80.3	S.S.E.	161	2	20	6 P				
23	3	26.7	.2090	70.3	N.W.	197	2¼	21	12-30 P	1-30 P			T.
24	5	16.7	.1460	67.7	S.	161	3½	26	1-30 A	9 P			T.
25	6	29.3	.2653	64.3	S.W.	178	1	14	0 A				
26	9	-13.3	.0599	42.	N.W.	288	10½	46	1-30 P				
27	8	-1.3	.0663	66.7	N.W.	305	4¾	31	2-30 A				
28	0	22.7	.1558	80.7	S.W.	136	1	14	3 A				
29	3	30.	.2364	73.	E.S.E.	84	¾	12	8-30 A	7 A	11 A		T.
30	2	24.7	.1932	70.3	N.E.	263	3¼	25	2 P				
31	9	20.	.1623	69.3	N.N.E.	286	6½	36	4 P				

†Early morning. T=trace.

REMARKS.

The temperature was about normal, the total precipition was below that of 1891, thirteen inches of snow fell during the month. During January of the preceding year $17\frac{3}{4}$ inches of snow fell.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 38. FEBRUARY, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.42, 27th, 9 P.
Actual minimum reading,	28.77, 12th, 4 A.
Mean reduced to sea level,	30.106
Monthly range,	1.65

*****Air Temperature.*** In Degrees Fahr.

Highest,	47 ; 46.5
Lowest,	2.5; -7.
Mean,	28.4 ; 26.1
Monthly Range,	41.5; 53.5
Highest mean daily,	40.1 ; 39.
Lowest mean daily,	12. ; 7.8
Mean maximum,	33.9; 36.
Mean minimum,	21.9; 16.2
Mean daily range,	12 ; 19.8
Greatest daily range,	34.5; 52.5
Least daily range,	2 ; 7.

Humidity.

Mean dew point,	20.9
Mean force of vapor,	.1753
Mean relative humidity,	72.8

Wind.

Prevailing Directions.

North.	24 per cent.
North West,	17 " "
North North East,	13 " "
North East,	11 " "
Other directions,	35 " "
Total movement,	3438m.
Greatest daily movement,	408 m., 27th.
Least daily movement,	19m., 7th.
Mean daily movement,	118.5 m.
Mean hourly velocity,	4.9 m.

Maximum pressure per square foot, 11½ lbs.= 18 m. per hour, 27th, at 6 A.

*****Precipitation.*** In inches.

Total precipitation,	1.00 ; 1.90

Weather.

Mean cloudiness observed,	55 per cent.
Number of clear days,	11
Number of fair days,	5
Number of cloudy days,	13
Total cloudiness recorded by the Sun Thermometer,	169 hours or 55 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	8
Number of inches of snow on the ground at the close of the month,	1 inch.

Bright Sunshine.

Number of Hours recorded,	138
Rain,	1st, 8th, 20th.
Snow,	2d, 3d, 7th, 11th, 12th, 14th, 15th, 20th, 21st, 28th, 29th.
Total fall in inches,	14.
Hail,	15th.
Aurora Borealis,	13th, 23d, 26th.
Mean Ozone,	28 per cent.

Halos.

Solar,	19th.
Lunar,	10th.
Corona,	4th.

Gal , of 40 or more miles per hour, 44, N.N.E. 26th : 48, N. N. E., 27th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.945	29.93	29.938	38.	38.5	4 P	22.	15.	6 A	31.3	60
2	29.98	29.91	29.948	38.5	39.5	12 M	32.	28.	7 A	35.1	10
3	29.91	29.84	29 86	34.	36.5	3 P	32.	29.	12 P	33.1	10
4	29.93	29.85	29.872	35.	35.5	2 P	26.	11.5	12 P	30.1	10
5	30.03	29.93	29.958	29.	35.5	1 P	13.	9.5	12 P	22.3	50
6	30.34	30.005	30.267	25.	32.	3 P	8.	–2.	5 A	15.8	20
7	30.34	29.77	30.108	25.	23.5	12 P	6.	–2.	7 A	15.6	10
8	29.77	29.58	29.627	39.	41.5	2 P	25.	20.5	1 A	34.1	40
9	29.785	29.66	29.715	43.	40.5	2 P	32.	27.	12 P	37.3	50
10	30.02	29.785	29.977	33.	36.	2 P	24.	17.	7 A	29.5	30
11	29.89	29.10	29.323	31.	31.	12 P	24.	18.	8 A	27.2	50
12	29.36	29.07	29.17	31.	32.	1 A	13.	11.	12 P	26.3	40
13	29.695	29.36	29.635	17.	18.	4 P	6.5	1.	7 A	12.	10
14	29.935	29.695	29.863	25.	30.5	5 P	6.	–2.	7 A	18.	10
15	30.25	29.83	30.01	33.	39.	12 M	26.	20.5	1 A	29.8	30
16	30.515	30.25	30.46	24.5	25.5	1 A	13.	8.5	12 P	20.1	0
17	29.59	29.415	30.497	20.	20.5	2 P	4.	–5.	7 A	13.4	0
18	30.415	30.095	30.192	37.	45.5	4 P	2.5	–7.	7 A	21.5	10
19	30.32	30.19	30.263	38.	44.	3 P	22.	14.5	7 A	31.9	0
20	30.425	30.295	30.367	37.	37.	1 A	33.	30.	5 A	34.4	20
21	30.48	30.425	30.457	37.	40.5	2 P	33.	31.	5 A	35.5	10
22	30.51	30.48	30.49	45.	44.5	2 P	36.	32.5	11 P	39.4	50
23	30.51	30.495	30.507	43.	45.	2 P	30.	21.5	6 A	36.6	30
24	30.51	30.40	30.468	38.	39.	1 P	33.5	30.	7 A	36.3	60
25	30.40	30.195	30.287	43.	45.	2 P	36.	31.	5 A	38.5	50
26	30.35	30.195	30.235	47.	46.5	2 P	36.	31.5	6 A	40.1	30
27	30.72	30.35	30.632	37.	40.5	1 A	19.	15.5	12 P	26.4	40
28	30.72	30.53	30.647	28.	27.	3 P	17.	12.	4 A	22.4	40
29	30.53	30.17	30.292	34.	34.5	2 P	26.	21.5	1 A	30.5	50

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	0	26.	.2017	73.7	N.	79	1	14	0 A	2 P		T.	
2	0	28.3	.2085	74.3	S.E.	26	0			2 P	12 P		
3	0	30.3	.2008	84.	N.	68	½	10	5 P	0 A	2 P	.66	5½
4	8	26.3	.1719	84.3	N.W.	147	1½	17	3 P				
5	5	15.	.1258	75.3	N.N.E.	101	2	20	7 P				
6	10	7.7	.0932	72.3	S.	84	1½	17	1 A				
7	1	10.3	.1027	74.3	S.	19	0			4-30 P			T.
8	1	30.3	.2361	73.7	S.W.	28	1	14	5 P	† – A		.08	
9	7	25.3	.2133	69.3	N.N.W.	104	3	24	5-30 P				
10	8	21.7	.1574	75.7	S.S.E.	102	2½	22	2 A				
11	0	24.	.1518	86.7	N.	220	2½	22	4 P	† – A	12 P		
12	6	11.7	.1271	62.	N.W.	221	4	28	8 P	0 A	† – A	.51	6
13	10	3.	.0702	77.3	N.	249	5½	33	10 A				
14	7	14.	.1255	75.	N.	44	¾	12	11 P	8 P	12 P		
15	9	20.3	.1685	68.3	N.W.	151	5	32	9 A	0 A	† – A	.21	1
16	11	8.	.0975	68.7	N.N.W.	152	3	24	2 P				
17	10	.7	.0773	64.7	N.W.	102	3¼	25	1-30 P				
18	11	15.7	.1470	77.3	N.	34	¼	7	7 P				
19	7	22.7	.2016	69.	N.	44	½	10	1 A				
20	0	32.3	.2054	89.3	N.	70	½	10	11 P	† – A	12 P	.44	1½
21	0	32.7	.2367	79.7	N.N.E.	135	1¾	19	5 P	7 A			T.
22	0	34.	.2561	77.	N.N.E.	151	3	24	12 M				
23	11	26.3	.2246	69.	E.	155	5½	33	2-30 P				
24	0	28.7	.2536	64.	E.S.E.	142	1½	17	12 M				
25	3	31.	.2837	65.	S.S.W.	53	¼	7	1 A				
26	5	33.7	.2921	69.7	E.N.E.	43	9½	44	10 P				
27	8	5.	.1341	36.7	N.E.	408	11½	48	6 A				
28	0	18.3	.1362	78.3	N.	233	6	35	4 A	7 A			T.
29	0	25.3	.1825	77.	E.	73	¾	12	2 P	7 A			T.

†Early morning. T=trace.

REMARKS.

The temperature was above normal. The rainfall was below the average

On the evening of the 13th, between 7 and 8 o'clock, a most magnificent auroral display was witnessed at the observatory ; for nearly an hour the north was illumined with brilliant streaming light. This aurora is of special interest for such intense brilliancy of color is rarely seen in this part of the world, and while the display lasted, telephone and telegraph lines could be worked without the aid of batteries.

C. D. WARNER; Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No 39. MARCH, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.16, 22d, 9 A.
Actual minimum reading,	28.99, 19th, 9 A.
Mean reduced to sea level,	29.895
Monthly range,	1.17

****Air Temperature.*** In Degrees Fahr.

Highest,	58; 60.5
Lowest,	16. ; 6.
Mean,	33.1; 31.4
Monthly Range,	42. ; 54.5
Highest mean daily,	44.7; 43.3
Lowest mean daily,	20.5; 20 8
Mean maximum,	39.3; 41.4
Mean minimum,	26.4; 21.5
Mean daily range,	12.9; 19.9
Greatest daily range,	30. ; 38.
Least daily range,	3.5; 10.

Humidity.

Mean dew point,	21.5
Mean force of vapor,	.2040
Mean relative humidity,	64.1

Wind.

Prevailing Directions.

North,	18 per cent.
North West,	18 " "
North North East,	14 " "
West North West,	10 " "
Other directions,	40 " "
Total movement,	7046m.
Greatest daily movement,	436 m., 2d.
Least daily movement,	57m., 8th.
Mean daily movement,	227.3 m.
Mean hourly velocity,	9.5 m.

Maximum pressure per square foot, 20½ lbs.= 64 m. per hour, 11th, at 3-30 P.

****Precipitation.*** In inches.

Total precipitation,	1.63; 2.40

Weather.

Mean cloudiness observed,	45 per cent.
Number of clear days,	15
Number of fair days,	5
Number of cloudy days,	11
Total cloudiness recorded by the Sun Thermometer,	173 hours or 47 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	8
Number of inches of snow on the ground at the close of the month,	0

Bright Sunshine.

Number of Hours recorded,	196
Rain.	8th, 10th, 18th, 23d.
Snow,	1st, 2d, 3d, 11th. 12th, 18th, 19th, 23d.
Total fall in inches,	8.
Hail,	8th.
Aurora Borealis,	6th, 24th, 25th.
Mean Ozone,	40 per cent.

Halos.

Solar,	5th, 16th, 17th, 22d.
Lunar,	17th.
Corona,	12th.

Gales, of 50 or more miles per hour, . 64, 11th, W.; 50, 12th, W.; 59, 14th, W. N. W.; 56, 15th, W.N.W.; 62, 19th, W.; 57, 20th, S.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.17	30.07	30.11	33.	34.	1 A	25.	24.	12 P	31.2	60
2	30.29	30.17	30.243	24.	28.	1 A	20.5	17.	10 A	21.4	60
3	30.21	29.88	29 948	29.5	32.	5 P	20.5	19.5	1 A	25.2	60
4	29.88	29.81	29.842	39.	44.	2 P	24.	20.	2 A	30.5	40
5	29.81	29.67	29.718	39.	40.5	12 M	28.5	22.	7 A	34.3	30
6	29.68	29.65	29.668	40.	41.	4 P	32.5	26.	1 A	35.6	20
7	29.73	29.675	29.71	49.	54.	5 P	31.	25.	6 A	39.3	10
8	29.745	29.375	29.617	42.	42.	2 P	30.5	24.	7 A	36.3	0
9	29.51	29.31	29.358	43.	47.	2 P	35.	32.5	7 A	38.9	30
10	29.67	29.34	29.613	46.5	50.	5 P	33.	27.	6 A	41.2	30
11	29.57	29.34	29.403	39.	50.	1 A	23.5	20.5	12 P	28.9	30
12	29.72	29.57	29.695	35.	36.	2 P	20.5	20.	5 A	28.5	20
13	29.86	29.72	29.827	27.	34.	3 P	21.	15.	9 P	37.1	30
14	30.01	29.86	29.917	24.	28.	3 P	16.	13.5	6 A	20.5	20
15	30.30	30.01	30.197	28.	29.	4 P	19.	16.	6 A	23.2	40
16	30.34	30.27	30.307	32.	32.5	5 P	21.	19.	5 A	25.	50
17	30.325	30.145	30.235	35.	35.5	4 P	16.	12.	7 A	25.9	30
18	30.17	29.41	29.777	31.	31.5	4 P	24.	20.	4 A	27.5	60
19	29.59	29.29	29.428	34.	32.	5 P	26.	21.5	8 A	30.8	50
20	30.065	29.59	29.78	33.	32.5	1 A	23.	19.5	12 P	29.2	30
21	30.37	30.065	30.26	33.	32.5	4 P	18.	9.5	6 A	25.8	60
22	30.45	30.305	30.38	42.	41.	5 P	16.	6.	6 A	30.3	20
23	30.405	29.815	29.942	39.	40.	11 P	31.	25.	3 A	34.3	60
24	30.035	29.86	30.015	43.	43.	4 P	35.	29.	6 A	38.4	50
25	30.035	29.97	29.993	49.	50.	5 P	35.	29.	2 A	41.4	50
26	29.98	29.81	29.875	57.	60.5	4 P	34.	26.	6 A	44.7	50
27	29.81	29.51	29.633	48.	49.5	2 P	34.	29.5	7 A	40.1	60
28	29.765	29.545	29.695	49.	51.5	4 P	32.	25.	4 A	40.7	70
29	30.125	29.765	30.012	47.	49.	4 P	34.	29.	6 A	39.5	50
30	30.23	30.125	30.205	51.	52.	4 P	30.	23.	6 A	39.1	20
31	30.42	30.23	30.35	58.	59.	4 P	28.	21.	5 A	42.4	40

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	0	24.	.1713	75.7	N.E.	368	$11\frac{1}{2}$	48	4-30 P	10-30 A	12 P		
2	0	12.3	.1211	65.	N.N.E.	436	$9\frac{1}{2}$	44	7-30 A	0 A	2 P	.24	2
3	0	15.7	.1909	61.3	N.N.E.	412	12	49	7-30 A	8 A	1 P		T.
4	11	23.	.1864	72.7	N.	253	$8\frac{3}{4}$	42	4 A				
5	6	20.3	.1988	58.7	N.W.	180	$4\frac{3}{4}$	31	11 A				
6	11	22.7	.2078	62.7	N.W.	264	$5\frac{3}{4}$	34	11 A				
7	11	30.3	.2566	70.7	N.W.	126	$2\frac{1}{4}$	21	9-30 A				
8	1	30.7	.2229	79.7	N.N.E.	57	$1\frac{1}{2}$	17	8 P	11-30 A	9 P	.55	T.
9	0	35.	.2576	80.7	W.	108	$2\frac{3}{4}$	23	4-30 P				
10	2	37.7	.3194	73.	S.S.E.	164	9	43	4 P	2 P	12 P		
11	0	17.7	.1574	63.7	W.	393	$20\frac{1}{2}$	64	3-30 P	0 A	4 P	.39	T.
12	2	16.3	.1620	58.7	W.	368	$12\frac{3}{4}$	50	1 A	1-30 P	6 P		T.
13	11	3.	.1157	46.3	W.N.W.	246	$9\frac{1}{4}$	43	12 M				
14	7	-3.	.1104	38.3	W.N.W.	382	$17\frac{3}{4}$	59	2-30 P				
15	6	11.	.1221	62.3	W.N.W.	340	$15\frac{1}{2}$	56	2 P				
16	6	18.	.1311	78.7	N.W.	129	$2\frac{1}{2}$	22	3 P				
17	8	19.3	.1611	70.	N.	146	$5\frac{1}{2}$	33	8 A				
18	0	25.	.1609	85.3	N.	208	$3\frac{1}{2}$	26	6-30 P	† – A	12 P		4
19	1	23.3	.1658	78.	W.S.W.	300	19	62	4 P	0 A	3 P	.45	1
20	6	15.	.1461	61.7	W.S.W.	374	$16\frac{1}{4}$	57	9 A				
21	11	14.7	.1392	65.7	N.W.	167	4	28	5-30 P				
22	11	23.7	.2030	72.3	S.	94	$2\frac{1}{2}$	22	10 P				
23	0	32.3	.2261	81.7	S.	95	$6\frac{1}{2}$	36	11 P	† – A	5 P	.77	1
24	9	23.3	.2290	55.7	N.W.	238	$10\frac{1}{2}$	46	12-30 A				
25	10	26.3	.2823	51.	N.W.	181	9	43	10 A				
26	12	33.	.3409	59.	S.W.	75	$1\frac{3}{4}$	18	4 P				
27	8	26.	.2508	58.3	N.	210	$4\frac{1}{2}$	30	9 A				
28	10	22.7	.2614	50.	N.W.	203	10	45	3 P				
29	12	15.7	.2412	38.7	N.	293	$10\frac{3}{4}$	46	4 P				
30	12	23.7	.2444	59.3	N.	145	7	37	2 P				
31	12	27.3	.3399	50.7	S.	91	2	20	7 P				

†Early morning. T=trace.

REMARKS.

The temperature and rainfall were below the normal. Unusually windy and blustering weather prevailed throughout nearly the whole month.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 40. APRIL, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.24, 1st, 10 A.
Actual minimum reading,	29.215, 9th, 3 P.
Mean reduced to sea level,	29.972
Monthly range,	1.025

**Air Temperature.* In Degrees Fahr.

Highest,	72; 78.5
Lowest,	27; 20.5
Mean,	48.7; 45.2
Monthly Range,	45. ; 58.
Highest mean daily,	63.8; 62.
Lowest mean daily,	37.5; 35.8
Mean maximum,	56.9; 58.6
Mean minimum,	39.1; 31.9
Mean daily range,	17.7; 26.7
Greatest daily range,	33. ; 42.
Least daily range,	.2; 12.

Humidity.

Mean dew point,	33.
Mean force of vapor,	.3796
Mean relative humidity,	54.5

Wind.

Prevailing Directions.

North West,	24 per cent.
South West,	11 " "
West North West,	10 " "
North East,	10 " "
Other directions,	45 " "
Total movement,	5370m.
Greatest daily movement,	349 m., 11th.
Least daily movement,	60m., 4th.
Mean daily movement,	179 m.
Mean hourly velocity,	7.5 m.

Maximum pressure per square foot, $16\frac{3}{4}$ lbs.= 58 m. per hour, 11th, at 2 P.

**Precipitation.* In inches.

Total precipitation,	.54; .76

Weather.

Mean cloudiness observed,	42 per cent.
Number of clear days,	17
Number of fair days,	6
Number of cloudy days,	7
Total cloudiness recorded by the Sun Thermometer,	158 hours or 39 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	3
Number of inches of snow on the ground at the close of the month,	0

Bright Sunshine.

Number of Hours recorded,	244
Rain,	2d, 4th, 5th, 21st, 22d, 23d, 28th, 29th.
Snow,	10th.
Total fall in inches,	T
Aurora Borealis,	23d, 24th, 25th, 26th, 29th.
Mean Ozone,	29 per cent.

Halos.

Solar,	3d, 5th, 7th, 8th, 14th, 15th, 25th.
Lunar,	3d, 7th.
Corona,	4th, 10th.

Gales, of 50 or more miles per hour, . 53, 6th, N. W.; 54, 10th, W.; 58, 11th, W. N. W.; 51, 15th, N.E.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.53	30.43	30.478	57.	60.5	3 P	30.	22.	6 A	48.5	30
2	30.44	30.005	30.17	56.	58.	4 P	41.5	35.	3 A	52.4	20
3	30.005	29.88	29 917	72.	76.	1 P	55.	48.	1 A	63.6	40
4	29.96	29.89	29.923	70.	74.	4 P	50.	46.5	9 A	60.4	50
5	29.92	29.80	29.883	72.	78.5	2 P	53.	45.	6 A	63.8	10
6	29.80	29.75	29.77	65.	70.	10 A	43.	39.	12 P	57.	20
7	29.81	29.78	29.802	63.	66.5	2 P	38.	30.	5 A	51.3	30
8	29.81	29.66	29.727	63.	65.5	2 P	44.	36.	6 A	54.1	40
9	29.66	29.51	29.55	51.	50.5	1 A	49.	31.	11 P	45.2	30
10	29.625	29.52	29.553	43.	45.	11 A	36.	28.5	1 A	39.1	50
11	29.825	29.625	29.735	41.	43.	12 M	35.	28.5	5 A	37.5	40
12	29.93	29.825	29.892	43.	44.	2 P	34.	27.	6 A	37.9	40
13	30.02	29.93	29.97	53.	55.	4 P	34.	27.	1 A	42.9	40
14	30.02	29.88	29.953	52.	51.5	2 P	33.	24.	5 A	44.1	20
15	29.88	29.70	29.74	54.	55.5	4 P	37.	32.	4 A	44.2	30
16	29.76	29.70	29.74	50.	51.5	3 P	37.	26.	3 A	43.1	30
17	29.775	29.76	29.77	53.	54.	4 P	33.	24.5	4 A	43.9	20
18	29.81	29.775	29.787	53.	57.	4 P	34.	26.5	5 A	45.7	40
19	30.30	29.81	30.107	55.	57.5	4 P	40.	32.	5 A	46.7	20
20	30.42	30.30	30.367	66.	67.	5 P	33.	25.	5 A	50.6	20
21	30.38	30.03	30.268	55.	57.	11 A	36.	27.5	5 A	46.1	30
22	30.03	29.795	29.878	56.5	57.	1 P	44.	41.	1 A	51.8	20
23	29.815	29.76	29.783	59.	56.5	6 P	48.	44.5	12 P	54.	20
24	30.30	29.815	30.017	56.	57.	3 P	35.5	33.5	12 P	48.6	10
25	30.51	30.30	30.428	56.	55.	4 P	27.	20.5	5 A	40.9	40
26	30.41	30.30	30.35	61.	63.5	3 P	31.	23.	5 A	47.6	20
27	30.45	30.31	30.375	65.	65.5	6 P	36.	25.	5 A	51.2	10
28	30.32	29.93	30.08	56.	57.5	5 P	45.	39.	6 A	50.	40
29	30.02	29.89	29.923	52.	53.	1 A	43.	39.5	12 P	50.6	40
30	30.33	30.02	30.23	58.	56.	5 P	39.	29.5	4 A	48.1	20

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	12	25.3	.3399	44.7	S.W.	118	2½	22	8-30 P				
2	0	45.7	.4263	73.7	S.W.	235	4½	30	11 A	10 A	5 P	T.	
3	10	47.7	.6800	53.7	W.N.W	304	11¼	48	12 M				
4	4	53.7	.5794	73.7	N. N. E.	60	¼	7	7-30 A	† – A	8-30 A	.20	
5	2	55.7	.7208	64.7	S.W.	71	5¼	32	12 P	10-30 A		T.	
6	9	38.	.4511	54.7	W.N.W	305	14	53	3 P				
7	12	37.	.4870	52.	S.W.	171	6½	36	4 P				
8	8	45.3	.4549	68.7	N.W.	142	6¼	35	2-30 P				
9	9	22.7	.2864	46.3	N.W.	231	10½	46	10 A				
10	7	18.	.2358	43.3	N.W.	242	14½	54	11 A	9 A			T
11	9	23.	.2234	58.3	W.N.W	349	16¾	58	2 P				
12	11	22.3	.2283	58.	N.W.	276	10½	46	1-30 P				
13	13	23.3	.2880	46.3	N.W.	237	7½	39	3 P				
14	4	31.7	.3607	51.7	S.W.	68	1½	18	1 P				
15	8	28.7	.3133	53.7	N.	272	13	51	3 P				
16	7	28.	.3136	52.	N.W.	158	7½	39	5 P				
17	11	22.	.3046	36.7	W.N.W	163	6¾	37	1 P				
18	8	32.	.3540	55.	N.E.	87	5½	33	12 P				
19	12	27.7	.3215	49.7	N.	244	10	45	3 P				
20	13	33.	.3920	52.3	S.S.E.	65	3½	26	11 A				
21	2	36.3	.3226	68.7	S.S.W.	70	1½	17	12 M	1 P	12 P	.52	
22	1	50.7	.4234	86.7	S.	90	2½	22	9 P	2 P	5 P	T.	
23	4	40.7	.4025	62.7	W.N.W	196	7½	39	10-30 A	7 A		T.	
24	14	28.7	.3492	53.	W.N.W	202	6½	36	10-30 P				
25	14	23.3	.2789	38.	N.	144	5½	33	1 A				
26	14	27.	.3785	42.	N.W.	105	3¼	25	4 P				
27	14	26.7	.3919	41.	S.	90	2½	22	10-30 P				
28	1	36.	.3494	61.	S.	318	8½	41	10 P	† – A	10-30 A	.04	
29	0	31.3	.3736	48.7	N.W.	166	3¼	25	6 P	10-30 A		T.	
30	11	28.7	.3575	44.	N.W.	191	6	35	1 P				

†Early morning. T=trace.

REMARKS.

The first few days of the month were usually warm but the greater part was characterized by strong cold winds; the temperature and rainfall were below normal; several brilliant auroras occurred; during the last part of the month heavy frosts were observed and on several occasions the ground was frozen to the depth of one-half inch.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 18.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft Above sea level. 260 ft.

BULLETIN No 41. MAY, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.13, 1st, 0 A.
Actual minimum reading,	29.19, 27th, 11 A.
Mean reduced to sea level,	29.943
Monthly range,	.94

**Air Temperature.* In Degrees Fahr.

Highest,	82. ; 84.
Lowest,	36.5; 28.
Mean,	55.1; 56.
Monthly Range,	45.5; 56.
Highest mean daily,	70.6; 71.5
Lowest mean daily,	41.5; 40.3
Mean maximum,	63. ; 65.3
Mean minimum,	49.1; 43.5
Mean daily range,	13.9; 21.7
Greatest daily range,	27. ; 37.
Least daily range,	.1; 8.5

Humidity.

Mean dew point,	44.9
Mean force of vapor,	.5407
Mean relative humidity,	60.3

Wind.

Prevailing Directions.

South West,	17 per cent.
North	13 " "
South, SouthWest,	13 " "
North West,	12 " "
Other directions,	45 " "
Total movement,	5056m.
Greatest daily movement,	369 m., 8th.
Least daily movement,	75 m., 2nd.
Mean daily movement,	163 m.
Mean hourly velocity,	6.8 m.

Maximum pressure per square foot, 15¾ lbs.= 56 m. per hour, 16th, at 3.30 P.

**Precipitation.* In inches.

Total precipitation,	4.73; 6.28

Weather.

Mean cloudiness observed,	66 per cent.
Number of clear days,	8
Number of fair days,	9
Number of cloudy days,	14
Total cloudiness recorded by the Sun Thermometer,	280 hours or 61 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	16

Bright Sunshine.

Number of Hours recorded,	183

Rain, 1st, 2d, 4th, 5th, 6th, 11th, 12th, 13th, 14th, 15th, 16th, 19th, 20th, 21st, 22d, 23d, 25th, 27th, 29th, 30th.

Aurora Borealis,	18th.
Rainbow.	12th.
Thunder and Lightning.	3rd, 12th.
Frost,	1st, 8th, 10th.
Mean Ozone,	39 per cent.

Halos.

Solar,	1st, 4th, 5th, 17th, 26th.
Coronae,	7th, 10th.

Gales, of 50 or more miles per hour, 53, 7th, N. W.; 50, 8th, N. N. E.; 56, 16th, N. W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.43	30.00	30.197	59.	61.5	3 P	36.5	28.	5 A	49.1	40
2	30.00	29.89	29.91	59.	61.	3 P	52.	47.	4 A	55.8	50
3	30.08	29.89	30 053	55.	58.	1 A	51.	48.	11 P	52.7	60
4	30.08	29.93	30.01	74.	77.	5 P	49.	44.	1 A	57.3	50
5	30.18	30.07	30.127	69.	69.5	3 P	49.	44.5	5 A	58.1	40
6	30.12	29.88	29.973	56.	55.	12 M	50.	45.	12 P	52.7	50
7	29.88	29.79	29.828	60.	59.5	5 P	47.	40.	11 P	52.6	60
8	30.13	29.80	29.972	60.	63.	3 P	42.	34.5	4 A	52.0	70
9	30.18	30.13	30.143	66.	68.5	4 P	46.	36.	3 A	57.5	30
10	30.17	30.05	30.113	71.	71.	3 P	44.	34.	5 A	57.2	20
11	30.05	29.80	29.89	54.5	56.5	3 P	50.	44.	4 A	52.3	40
12	29.80	29.75	29.753	64.	60.	4 P	50.	47.5	4 A	56.3	70
13	30.175	29.78	30.093	55.	57.	4 P	50.	46.5	4 A	53.0	60
14	30.35	30.17	30.268	62.	64.5	3 P	52.	47.	4 A	56.2	40
15	30.31	29.98	30.085	57.	58.5	1 P	53.	48.	1 A	54.8	50
16	29.98	29.845	29.868	70.	73.	3 P	55.	51.5	1 A	63.2	60
17	30.07	29.925	30.027	71.	72.	4 P	53.	42.	5 A	63.2	50
18	30.02	29.94	29.983	73.	75.	3 P	52.	40.	4 A	63.9	20
19	30.005	29.90	29.942	63.	66.	12 M	43.	36.5	12 P	53.7	10
20	30.07	29.88	29.907	44.	48.5	2 P	38.	35.	9 A	42.4	50
21	30.12	29.89	30.027	43.5	44.5	1 A	38.5	36.	12 P	41.5	50
22	29.89	29.78	29.813	56.	56.5	2 P	38.5	35.5	1 A	44.8	40
23	29.78	29.515	29.568	54.	57.	3 P	44.	41.	5 A	49.1	50
24	29.73	29.55	29.653	64.	67.	4 P	48.	43.	5 A	56.7	10
25	29.76	29.73	29.755	70.	75.	1 P	55.	49.5	2 A	62.0	40
26	29.76	29.72	29.753	73.	76.5	6 P	57.	52.5	6 A	65.1	50
27	29.72	29.47	29.523	61.	68.	3 P	55.	52.	12 P	58.5	50
28	29.89	29.525	29.755	65.	67.	4 P	53.	47.	4 A	58.8	40
29	29.96	29.90	29.937	70.	74.	4 P	46.5	37.	5 A	61.7	30
30	30.07	29.94	30.007	73.	76.5	4 P	62.	58.	1 A	65.9	40
31	30.17	30.07	30.108	82.	84.	5 P	63.	59.	3 A	70.6	40

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	8	34.3	.4368	51.3	S.W.	166	10½	46	1-30 P	3-30 P	6-30 P	.04	
2	0	53.	.4933	81.7	S.S.W.	75	½	10	12-30 A	9-30 A	9 P	.47	
3	0	45.7	.4651	67.7	S.E.	136	6	35	11 P				
4	5	44.3	.5483	57.7	S.S.W.	228	7	38	7 P	0 A	4 A	.55	
5	9	35.7	.4867	45.3	N. N. E.	143	11	47	7 A	9 P		T.	
6	0	41.	.4370	60.3	N.	86	¼	7	12-30 A	3-30 P	6 P	.05	
7	11	31.	.3896	46.	N.W.	210	14	53	5-30 P				
8	14	36.	.4512	47.7	N.	369	12½	50	1 P				
9	14	39.	.5161	47.7	N.	186	9½	44	2 P				
10	14	39.3	.5716	46.	S.S.W.	100	2¾	23	10-30 A				
11	0	47.3	.4556	72.3	N.N.W.	122	1	14	12 M	† – A	5 P	.27	
12	4	50.3	.5796	64.3	S.S.E.	92	1	14	6 P	† – A	7 P	.02	
13	0	47.3	.4651	49.7	S.S.E.	92	1½	17	2-30 A	3-30 P		T.	
14	3	45.	.5009	62.3	S.W.	120	2¼	21	9 P	11 P	12 P		
15	0	53.3	.5076	81.	S.E	85	½	10	2 P	0 A	5 P	.96	
16	7	48.	.6671	53.7	N.W.	247	15¾	56	3-30 P	9-30 A		T.	
17	15	40.7	.5949	43.	W.N.W	215	9½	43	3-30 P				
18	15	40.	.6595	39.3	N.	175	10	45	5 P				
19	6	41.7	.4912	57.7	S.E.	217	5¼	32	7 P	6 P	12 P		
20	0	37.	.3067	69.7	N.N.E.	198	6¾	37	11 P	0 A	7 P	.84	
21	0	36.	.2888	74.3	N.E.	125	2	20	1 P	† – A	12 P		
22	4	43.3	.3926	75.	N.	182	2¼	21	10 A	0 A	12 P		
23	5	40.7	.4096	67.3	N.	164	3	24	2 P	0 A	9 A	2.59	
24	7	41.3	.5247	54.	N.W.	210	8½	41	2 P				
25	4	52.7	.7024	59.	S.W.	182	5	32	11 A	4 P	9 P	.01	
26	8	57.	.7532	63.3	S.S.W.	145	2	20	10-30 P				
27	5	50.3	.5455	68.	S.S.W.	214	4½	30	3-30 P	1 A	11 A	.31	
28	6	47.7	.5597	57.7	W.N.W	146	2¾	23	3 P				
29	11	50.3	.6605	57.7	S.S.W.	174	6¾	37	2.30 P	6 P		T.	
30	1	63.	.9248	78.7	S.S.W.	154	1½	18	4-30 A	4 P	5-30 P	.17	
31	7	64.	.8748	71.	S.S.W.	98	1	14	9 P				

†Early morning. T=trace.

REMARKS.

The temperature was slightly below normal, the weather was windy and disagreeably cool, and several frosts occurred during the first part of the month.

A brilliant aurora was observed on the 18th which was followed by a sudden fall in temperature, heavy rains and snow, the latter being visible on the surrounding hills the 20th and 21st.

The rain fall was much above normal.

A record of official and local weather forecasts was begun at the observatory on January 1 of the present year, for the purpose of ascertaining the percentage of accuracy as regards this location; these printed forecasts compared with the observatory records show 71% of the government and 80.6% of the local forecasts to have been correct.

The following is a brief summary furnished by the New England Weather Service which co-operates with this observatory:

> The weather for the month was influenced by the passage of seven cyclonic areas, or storms, and six anticyclonic areas, or areas of fair cool weather. They were not generally marked in energy nor of rapid movement.
>
> The temperature for the month was slightly below the normal; the highest was a few degrees over 80 at most stations and occured on the 31st; the lowest was from 25 to 30 and occurred on the 1st.
>
> The precipitation was above the average and there was an unusually heavy excess of clouds and number of rainy days. Very heavy rain fell throughout all the central and western districts from the 20th to 23d. In the extreme west the temperature on the 20th was near the freezing point of water and considerable snow fell. It is not thought that fruit was injured to any extent by the cold weather. The season is generally about one week behind the average at the end of the month, but with the present promise of warm weather it will rapidly recover.

C. D. WARNER, Meteorologist.

A. T. BEALS, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 42. JUNE, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.11, 4th, 9 A.
Actual minimum reading,	29.28, 20th, 2 P.
Mean reduced to sea level,	29.923
Monthly range,	.83

**Air Temperature.* In Degrees Fahr.

Highest,	92. ; 95.
Lowest,	49. ; 41.
Mean,	70.3 ; 69.3
Monthly Range,	43. ; 54.
Highest mean daily,	82.1 ; 77.
Lowest mean daily,	63.1 ; 60.7
Mean maximum,	78.6 ; 81.4
Mean minimum,	61.7 ; 57.2
Mean daily range,	16 9 ; 24.2
Greatest daily range,	30. ; 41.
Least daily range,	5. ; 11.5

Humidity.

Mean dew point,	62.3
Mean force of vapor,	.8683
Mean relative humidity,	68.9

Wind.

Prevailing Directions.

South West,	20 per cent.
South	19 " "
South, South West,	14 " "
North West,	10 " "
Other directions,	37 " "
Total movement,	450° m.
Greatest daily movement,	286 m., 20th.
Least daily movement,	28 m., 9th.
Mean daily movement,	150 m.
Mean hourly velocity,	6.3 m.

Maximum pressure per square foot, 20½ lbs.= 64 m. per hour, 30th, at 3 P.

**Precipitation.* In inches.

Total precipitation,	2.61 ; 3.46

Weather.

Mean cloudiness observed,	50 per cent.
Number of clear days,	8
Number of fair days,	12
Number of cloudy days,	10
Total cloudiness recorded by the Sun Thermometer,	238 hours or 48 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	10

Bright Sunshine.

Number of Hours recorded,	218

Rain, 2d, 4th, 5th, 8th, 9th, 14th, 17th, 20th, 21st, 23d, 25th, 26th, 27th, 28th, 30th.

Rainbow. . . . . 14th, 23d, 26th, 30th.

Thunder and Lightning. 2d, 9th, 14th, 17th. 23d, 27th, 30th.

Mean Ozone, ... 39 per cent.

Halos.

Solar,	4th, 8th, 10th, 11th, 13th, 14th, 29th.
Coronae,	5th, 7th.

Gales, of 50 or more miles per hour, . 55, 14th, S. W.; 51, 20th, N. W.; 64, 30th, S. W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
DAY.	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.20	30.08	30.127	80.	86.	2 P	64.	61.	5 A	72.1	30
2	30.08	29.93	29.99	84.	89.5	1 P	66.	62.	3 A	76.	30
3	30.16	29.93	30 04	71.5	75.	4 P	61.	58.5	12 P	67.3	10
4	30.39	30.16	30.35	69.	70.5	12 M	59.	53.	5 A	63.1	40
5	30.38	30.05	30.217	70.	74.	3 P	58.	52.5	4 A	64.	50
6	30.05	29.84	29.897	78.	82.	3 P	64.	61.	2 A	71.2	40
7	30.14	29.88	30.075	76.	79.	3 P	59.	56.	12 P	67.5	60
8	30.20	30.08	30.143	74.	76.	2 P	53.	45.5	4 A	64.3	20
9	30.08	29.81	29.905	72.	75.5	3 P	59.	55.	5 A	65.	50
10	29.96	29.81	29.925	71.	76.	3 P	55.	53.	12 P	63.8	40
11	30.04	29.92	29.957	78.	82.	2 P	49.	41.	3 A	66.4	60
12	29.93	29.87	29.893	88.	90.	5 P	58.	49.5	4 A	75.2	50
13	29.93	29.85	29.887	92.	94.	5 P	70.	60.	3 A	82.1	40
14	29.86	29.63	29.783	91.5	95.	3 P	68.	56.	12 P	80.	10
15	30.08	29.80	30.003	81.	83.5	5 P	62.	63.	12 P	69.9	40
16	30.11	29.98	30.04	76.	81.5	2 P	59.	54.	4 A	69.4	50
17	30.11	29.91	30.013	87.	92.5	3 P	65.	65.5	12 P	74.8	30
18	30.25	30.11	30.197	72.	71.	5 P	63.	59.5	3 A	66.7	40
19	30.14	29.78	29.88	80.	83.5	4 P	62.	57.	5 A	69.8	20
20	29.78	29.55	29.58	84.	86.	3 P	70.	67.	1 A	76.4	50
21	29.645	29.58	29.615	86.	88.5	5 P	68.	62.	5 A	77.3	40
22	29.70	29.60	29.622	82.5	84.	3 P	69.	62.	4 A	77.5	30
23	29.75	29.70	29.727	77.	71.	9 A	61.	58.	12 P	67.9	30
24	29.885	29.73	29.825	81.	80.	3 P	58.	51.	4 A	69.1	50
25	29.89	29.83	29.863	77.	78.	5 P	60.	57.	5 A	67.3	40
26	29.93	29.88	29.913	77.	79.	3 P	59.	52.	5 A	68.3	20
27	29.93	29.68	29.873	70.	72.	4 P	65.	60.	4 A	67.1	40
28	29.75	29.55	29.617	77.	80.5	1 P	64.	62.	12 P	71.2	50
29	29.92	29.75	29.907	78.	78.5	2 P	61.	53.	4 A	70.2	50
30	29.91	29.73	29.82	78.	82.5	2 P	63.	60.	12 P	68.7	50

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	11	85.7	.9368	66.7	W.	179	$4\frac{1}{2}$	30	2-30 P				
2	8	68.3	1.0495	68.7	S.W.	191	$2\frac{1}{2}$	22	3 P	2 P	3-30 P	T.	
3	4	58.	.7248	69.	N.	193	$8\frac{3}{4}$	42	11 A	† – A	9-30 A	.20	
4	2	50.7	.6627	59.7	S.W.	55	$1\frac{1}{2}$	17	8 A	1-45 P		T.	
5	0	59.3	.7300	70.3	S.S.W.	117	$1\frac{1}{2}$	17	3 P	3 P	5 P	T.	
6	6	63.3	.8720	68.3	S.W.	163	5	32	3 P				
7	15	47.3	.7171	48.	N.	102	$6\frac{3}{4}$	37	7 A				
8	12	49.	.6751	54.3	S.S.W.	83	$1\frac{1}{4}$	16	2-30 P	8 P	9 P	T.	
9	1	62.3	.7552	75.7	N.	28	0	—	—	† – A	6 P	.10	
10	11	48.3	.6377	53.	N.E.	168	$4\frac{1}{2}$	30	8-30 A				
11	15	53.3	.7257	61.	S.W.	100	$1\frac{1}{2}$	17	3-30 P				
12	15	63.3	1.0269	61.	N.W.	135	$2\frac{3}{4}$	24	1-30 P				
13	15	69.7	1.2456	60.3	S.W.	141	$3\frac{3}{4}$	28	3 P				
14	9	68.3	1.2590	59.	S.W.	164	15	55	6 P	5-30 P	8 P	.30	
15	15	58.3	.9125	57.	S.	132	$5\frac{1}{4}$	33	8 P				
16	8	64.7	.8539	74.	S.W.	233	5	32	2 P				
17	7	67.7	1.0563	70.3	S.W.	205	$6\frac{1}{2}$	36	2 P	3-30 P	4 P	.06	
18	0	58.3	.7198	68.	S.S.E.	130	0	—	—				
19	2	85.3	.8231	78.	S.S.W.	136	2	20	3-30 P	9-30 P	1 A	.08	
20	7	64.7	1.0280	62.	W.N.W	286	13	51	1-30 P	7 A		T.	
21	10	66.7	1.0941	60.7	W.N.W	130	$3\frac{1}{2}$	26	1 P	10 A	5 P	.78	
22	11	60.	.9913	53.7	N.W.	157	$6\frac{1}{2}$	36	9-30 A				
23	3	59.	.7221	70.7	N.	88	$4\frac{1}{2}$	30	12 M				
24	10	58.3	.7773	65.7	S.	92	2	20	9 P				
25	2	61.3	.7809	72.7	S.	199	3	24	2 A	† – A	7 A	.17	
26	4	62.7	.8644	69.3	S.W.	67	$1\frac{3}{4}$	18	2 P	1-30 P	1-45 P	T.	
27	0	63.3	.7240	81.	S.S.E.	194	$5\frac{1}{2}$	33	10 P	10-30 A	8-30 P	.45	
28	5	63.	.9384	63.7	S.W.	286	11	47	1-30 P	† – A	5-30 A	.33	
29	7	62.	.8676	66.7	S.W.	137	$4\frac{1}{4}$	29	6-30 P				
30	3	66.7	.8786	78.	S.W.	209	$20\frac{1}{2}$	64	3 P	† – A	12 P	.99	

†Early morning. T=trace.

REMARKS.

The weather was characterized by alternate hot and cool waves; in several instances the change of temperature took place in a short space of time. On the 14th the mercury fell 20° in 20 minutes. The weather for the month, however, compares favorably with the coaresponding month of the preceding year, there being but slight difference in the mean barometric pressure, humidity, and bright sunshine. The rainfall was slightly below normal, but the mean temperature was a little above normal.

For Amherst, 83.3% of the government forecasts and 70% of the local forecasts were found to be correct.

The following is a summary furnished by the Director of the New England Weather Service.

The weather for the month of June, 1892, for Massachusetts as reported by the voluntary observers of the New England Weather Service, controlled by an unusually large number of cyclonic areas or storms, nearly all poorly defined and all, with one exception, passing to the north of New England. This northerly movement caused a prevalence of Southwest winds and consequently an abnormally warm month. The mean temperature at most stations was several degrees higher than usual while the range for the month was very large; the lowest occurred on the night of the 10th–11th, the mercury falling dangerously near the freezing point of water. A sharp frost was experienced on many lowlands, especially in the eastern sections; gardens were injured in northeastern Massachusetts and some cranberry bogs were badly injured on the Cape. The highest temperature was on the 14th, and, with the exception of on some of the coast islands, reached over 90°.

Very heavy local storms occurred accompanied by severe and destructive lightning and hail. Many buildings were struck and some burned by lightning on the 2d, 14th and 17th. The house of Ebenezer Foster at Barre Plains village was struck by lightning during the storm of the 2nd and Mr. Foster who was sitting in the kitchen at the time was instantly killed.

On the 14th the thunderstorm was accompanied by heavy hail which did much damage in the upper Connecticut valley. At Turners Falls the average size of the large stones was $1\frac{2}{3}$ x $1\frac{1}{4}$ inches and the average weight was one-half ounce. The precipitation was above the normal except in the southeastern sections: the local storms were not so severe there as in northern and western districts.

The lack of sunshine during the last part of the month has delayed haying, and the season is slightly behind the average.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 43. JULY, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.22, 7th, 8 A.
Actual minimum reading,	29.25, 3rd, 10 P.
Mean reduced to sea level,	29.988
Monthly range,	.97

****Air Temperature.*** In Degrees Fahr.

Highest,	93.5; 94.
Lowest,	50. ; 42.
Mean,	72.1; 69.3
Monthly Range,	43.5; 52.
Highest mean daily,	82.5; 81.
Lowest mean daily,	63.5; 58.5
Mean maximum,	82.2; 83.1
Mean minimum,	61.5; 55.5
Mean daily range,	20.7; 27.7
Greatest daily range,	29. ; 35.
Least daily range,	11. ; 12.

Humidity.

Mean dew point,	60.9
Mean force of vapor,	.8598
Mean relative humidity,	65.6

Wind.

Prevailing Directions.

South West,	14 per cent.
South, SouthWest,	13 " "
West,	12 " "
South,	11 " "
Other directions,	50 " "
Total movement,	3365 m.
Greatest daily movement,	276 m., 16th.
Least daily movement,	27 m., 5th.
Mean daily movement,	108 m.
Mean hourly velocity,	4.5 m.

Maximum pressure per square foot, $11\frac{1}{2}$ lbs. = 48 m. per hour, 4th, at 2-30 P.

****Precipitation.*** In inches.

Total precipitation,	3.28; 4.41

Weather.

Mean cloudiness observed,	35 per cent.
Number of clear days,	12
Number of fair days,	14
Number of cloudy days,	5
Total cloudiness recorded by the Sun Thermometer,	185 hours or 40 per cent.
Number of days on which .01 inch or more rain fell,	9

Bright Sunshine.

Number of Hours recorded,	287

Rain, 1st, 3rd, 8th, 9th, 16th, 19th, 22nd, 25th, 28th, 29th, 31st.

Auroras, ... 16th, 17th, 20th, 21th, 25th.

Rainbow. . . . . 28th.

Thunder and Lightning. 3rd, 13th, 14th, 16th, 22d, 23d, 26th, 28th, 29th.

Mean Ozone, ... 33 per cent.

Halos.

Solar,	21st, 22nd, 24th.
Lunar,	4th, 5th.
Coronae,	1st, 9th.

Gales, of 50 or more miles per hour, ... 0.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.005	29.88	29.988	70.	69.	6 P	59.	57.	12 P	63.5	60
2	30.12	29.90	30.05	72.	75.	2 P	50.	44.	4 A	64.2	40
3	29.90	29.53	29.633	78.	82.	2 P	63.	61.	1 A	68.6	50
4	30.20	29.54	30.03	70.	73.	3 P	59.	56.5	12 P	65.2	50
5	30.32	30.20	30.283	77.	76.	3 P	51.	44.5	4 A	66.1	40
6	30.475	30.32	30.415	73.	78.	2 P	53.5	47.5	4 A	63.6	30
7	30.50	30.38	30.443	80.	79.5	6 P	53.	47.	6 A	65.9	40
8	30.38	30.16	30.247	78.	80.	1 P	53.5	47.	5 A	66.5	30
9	30.17	30.05	30.09	69.	70.	3 P	56.	49.	5 A	63.5	10
10	30.07	30.02	30.053	84.	85.5	4 P	57.	52.	5 A	73.4	40
11	30.07	29.94	30.02	92.	90.	6 P	65.	56.5	4 A	78.	20
12	29.98	29.82	29.893	93.	89.5	6 P	64.	56.	4 A	77.7	20
13	29.85	29.71	29.792	91.	91.5	4 P	67.	60.	5 A	78.5	30
14	29.89	29.78	29.833	86.	88.5	5 P	69.	64.	5 A	76.6	10
15	29.89	29.72	29.817	87.	88.5	3 P	63.	56.5	4 A	76.7	10
16	30.01	29.64	29.84	72.	78.5	1 A	58.	55.	12 P	68.2	20
17	30.08	30.01	30.057	75.	75.	5 P	51.	42.	4 A	65.3	40
18	30.10	30.03	30.067	81.	79.	7 P	55.	46.	4 A	69.8	20
19	30.08	29.93	30.013	79.	80.	12 M	62.	54.	4 A	71.3	60
20	30.00	29.89	29.917	82.	83.	4 P	63.	61.	12 P	73.5	40
21	30.11	30.00	30.06	83.	81.5	4 P	55.	46.5	5 A	70.	40
22	30.03	29.85	29.94	86.	87.5	5 P	64.	55.5	1 A	74.9	20
23	29.93	29.85	29.867	89.	88.5	6 P	64.	56.5	5 A	75.9	50
24	29.97	29.86	29.903	86.	87.	3 P	63.	56.	5 A	76.9	40
25	29.93	29.88	29.913	93.	92.	4 P	75.	70.	1 A	82.3	50
26	29.91	29.79	29.857	92.	93.	4 P	74.	68.	4 A	82.5	40
27	29.89	29.79	29.84	93.5	93.	5 P	70.	61.	4 A	81.9	30
28	29.86	29.77	29.837	91.	93.5	3 P	69.	62.	4 A	77.6	20
29	29.93	29.81	29.897	91.	94.	4 P	68.	63.	4 A	77.8	30
30	30.065	29.89	29.997	83.	84.	4 P	70.	65.	4 A	75.2	20
31	30.09	30.01	30.052	72.	72.	1 A	61.	59.	11 P	66.1	20

DAILY SUMMARY.

		HUMIDITY.			WIND.					PRECIPITATION.			
												TOTAL IN INCHES.	
DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	SNOW.
1	3	58.	.6410	76.	S.S.W.	53	0	—	—	6-30 A	10-30 A	.02	
2	9	57.3	.7167	67.3	S.S.W.	106	$6\frac{3}{4}$	37	4-30 P	—	—	—	
3	0	67.7	.8354	83.	S.W.	260	11	47	4 P	† - A	8 P	.85	
4	10	47.7	.6208	53.	N.W.	245	$11\frac{1}{2}$	48	2-30 P	—	—	—	
5	6	51.3	.6599	61.3	W.	27	0	—	—	—	—	—	
6	11	50.3	.6718	59.7	N.	111	$1\frac{1}{2}$	17	9 A	—	—	—	
7	12	51.7	.7318	57.	N.	73	$5\frac{1}{2}$	33	11 A	—	—	—	
8	6	57.7	.6925	68.3	S.W.	54	1	14	7 P	7 P	8 P	.18	
9	2	58.3	.6621	74.7	S.W.	56	0	—	—	2-30 P	6-30 P	.07	
10	15	62.3	.9212	67.3	W.	77	2	20	2 P	—	—	—	
11	15	61.7	1.0143	58.	W.	52	0	—	—	—	—	—	
12	14	64.3	1.0017	62.7	S.W.	55	$\frac{1}{2}$	10	3 P	—	—	—	
13	11	66.	1.0558	64.7	S.W.	110	$5\frac{1}{2}$	33	7 P	—	—	—	
14	7	65.7	1.0213	63.3	N.E.	52	$\frac{1}{2}$	10	8 P	—	—	—	
15	14	65.7	1.0085	67.3	S.W.	72	$2\frac{3}{4}$	23	10 P	—	—	—	
16	10	54.3	.6781	64.3	N.W.	276	9	42	9 A	† - A	† - A	.79	
17	14	47.7	.6364	52.	N.W.	165	$6\frac{1}{2}$	36	2-30 P	—	—	—	
18	14	52.3	.7795	52.	W.	140	$3\frac{1}{2}$	26	1-30 P	—	—	—	
19	5	60.3	.7545	70.7	S.W.	142	4	28	4 P	6 P	—	T.	
20	6	55.3	.8489	54.3	N.N.W	164	2	20	11 A	—	—	—	
21	14	54.3	.7654	59.	S.W.	59	0	—	—	—	—	—	
22	11	60.7	.9479	58.3	S.W.	118	2	20	11 P	8-45 P	11 P	.33	
23	13	61.7	.9187	64.	W.	66	0	—	—	—	—	—	
24	6	78.7	1.0389	69.7	S.	112	$3\frac{1}{2}$	26	7 P	—	—	—	
25	5	71.	1.1035	71.	S.S.E	124	4	28	5-30 P	5-30 A	6 A	T.	
26	8	68.	1.0976	65.	W.N.W	169	6	35	4 P	—	—	—	
27	14	72.	1.1154	57.7	N.W.	66	$\frac{1}{2}$	10	1 P	—	—	—	
28	5	70.	1.1028	70.	S.E.	76	$2\frac{3}{4}$	23	7 P	6-30 P	7 P	.48	
29	10	72.	1.0836	76.3	S.S.W.	85	$4\frac{1}{4}$	29	8 P	7 P	10-30 P	.59	
30	7	64.3	.8993	69.	N.	139	6	35	10-30 A			—	
31	0	61.	.6271	87.	N.	61	0	—	—	8-30 A	12 P	1.1	

†Early morning. T=trace.

REMARKS.

The month was characterized by an excessive amount of heat, a small percentage of cloudiness and low humidity. Only nine times during the period of fifty-five years has the maximum temperature for July at Amherst reached 94° (the maximum for the present month), and only seven times has the minimum temperature reached 42°.

Several severe thunder showers occurred during the latter part of the month and a number of brilliant auroras were observed.

The rainfall was slightly below normal.

Of the Washington forecasts 87 per cent. and of the local forecasts 88.8 per cent. were correct for Amherst.

The following summary is furnished by the Director of the New England Weather Service:

The weather for Massachusetts for the month of July, 1892, was characterized by high and extreme ranges of temperature, an abundance of sunshine and a lack of precipitation. The weather was controlled by the passage of eight cyclonic and five anticyclonic areas, and while the latter were only about one-half the number of the former, they were of much greater energy and duration and their influence prevailed during the greater part of the month. The local storms were not abundant but were of considerable energy, and some damage was done by wind and lightning.

Unusually low temperatures occurred on the morning of the 4th and 17th, with the passage of the first and third anticyclones, respectively. Slight frosts were reported in the northern New England states, although no damage has been reported in Massachusetts. From the 2nd to the 29th, excessively high temperatures prevailed over the entire state, although along the coast the heat of the 28th and 29th was tempered by an east wind. At Boston the mean temperature for the 25th, 26th and 27th was 83.6°, while at Amherst the mean for the 25th, 26th, 27th, 28th, 29th was 93.1°.

The drought during the last part of the month was sharp and severe, although no serious damage is anticipated. It was broken by thunder showers on the 29th and by a steady northeast storm on the 31st and August 1st. At Springfield, Mass., the rainfall on the 29th was 2.00 inches, and at Worcester, Mass., the fall on the same day was 1.49 inches; at Amherst, 1.1 inches.

The aurora of the 16th was one of the most marked ever noticed in Massachusetts at this season of the year. It was preceded by an apparent lunar rainbow, and throughout its appearance was of rare beauty.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 44. **AUGUST, 1892.**

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	29.96, 23rd, 9 A.
Actual minimum reading,	29.41, 25th, 5 P.
Mean reduced to sea level,	30.017
Monthly range,	.55

****Air Temperature.*** In Degrees Fahr.

Highest,	89; 94.
Lowest,	54.; 50.
Mean,	70.1; 68.9
Monthly Range,	35.; 44.
Highest mean daily,	79.5; 80.
Lowest mean daily,	57.; 58.
Mean maximum,	78.2; 80.6
Mean minimum,	62.3; 57.2
Mean daily range,	15.9; 23.4
Greatest daily range,	26. ; 35.
Least daily range,	4.5; 10.

Humidity.

Mean dew point,	62.1
Mean force of vapor,	.7765
Mean relative humidity,	74.9

Wind.

Prevailing Directions.

North,	17 per cent.
SouthWest,	15 " "
North, NorthEast,	11 " "
SouthEast,	9 " "
Other directions,	48 " "
Total movement,	3390 m.
Greatest daily movement,	248 m., 27th.
Least daily movement,	37 m. 3rd.
Mean daily movement,	109 m.
Mean hourly velocity,	4.5 m.

Maximum pressure per square foot, $7\frac{1}{2}$ lbs. = 39 m. per hour, 19th, at 4-30 P.

****Precipitation.*** In inches.

Total precipitation,	5.23; 6.475

Weather.

Mean cloudiness observed,	53 per cent.
Number of clear days,	6
Number of fair days,	14
Number of cloudy days,	11
Total cloudiness recorded by the Sun Thermometer,	227 hours or 53 per cent.
Number of days on which .01 inch or more rain fell,	16

Bright Sunshine.

Number of Hours recorded,	201

Rain, 1st, 2nd, 3rd, 4th, 5th, 6th, 9th, 11th, 12th, 13th, 19th, 20th, 25th, 26th, 27th, 31st.

Thunder and Lightning, 4th, 9th, 10th, 11th, 12th, 19th, 20th, 22nd, 26th.

Mean Ozone, ... 30 per cent.

Halos.

Lunar,	6th.
Corona,	31st.
Gales, of 35 or more miles per hour,	0.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.03	30.00	30.017	68.	71.	4 P	60.	57.5	5 A	64.8	50
2	30.03	29.94	29.983	70.	73.	12 M	64.	60.5	1 A	66.6	20
3	29.95	29.92	29.937	82.	84.	5 P	63.	61.	3 A	71.1	20
4	29.95	29.81	29.878	84.	86.	5 P	61.	55.	4 A	73.5	30
5	29.86	29.77	29.817	82.	85.5	5 P	67.	62.	3 A	72.4	10
6	29.92	29.77	29.80	82.	83.	3 P	65.	58.	4 A	72.4	60
7	30.07	29.86	30.043	85.	82.	5 P	63.	56.	5 A	72.9	30
8	30.07	29.92	29.993	83.	86.	4 P	64.	57.	5 A	73.9	20
9	29.92	29.76	29.847	88.	92.	5 P	72.	67.	1 A	77.7	40
10	29.94	29.86	29.908	88.	94.	3 P	72.	66.	1 A	79.5	60
11	29.92	29.80	29.86	86.	92.	1 P	73.	66.	5 A	78.9	20
12	29.82	29.72	29.752	81.	80.	5 P	63.	60.	11 P	71.8	30
13	29.86	29.77	29.827	77.	74.	6 P	61.	58.	5 A	67.7	50
14	29.96	29.85	29.912	73.	76.5	4 P	60.	53.	5 A	67.3	0
15	30.06	29.95	29.993	81.	83.	6 P	57.	50.5	5 A	69.2	0
16	30.11	30.04	30.817	83.	84.	3 P	58.	50.	5 A	72.	10
17	30.11	30.04	30.07	88.	88.	6 P	62.	53.	4 A	74.3	20
18	30.11	30.04	30.075	89.	90.5	4 P	63.	56.5	6 A	75.8	0
19	30.09	29.99	30.037	83.	81.	3 P	67.	64.	12 P	73.7	30
20	29.99	29.91	29.94	75.5	79.	1 P	64.	60.	4 A	70.6	30
21	29.92	29.83	29.877	81.	81.	5 P	66.	59.	4 A	71.8	20
22	30.165	29.92	30.04	77.	80.5	1 P	61.	51.	5 A	69.5	40
23	30.24	30.165	30.207	79.	81.	4 P	59.	53.	5 A	68.4	20
24	30.20	30.07	30.125	77.	78.	2 P	60.	54.	4 A	67.8	10
25	30.08	29.69	29.82	70.	73.	2 P	62.	56.5	5 A	67.6	20
26	30.01	29.70	29.943	62.5	74.	1 P	58.	57.	12 P	60.9	50
27	30.05	30.01	30.037	58.5	63.	4 P	54.	53.	12 P	57.	50
28	30.06	30.00	30.035	69.5	74.	4 P	54.	51.	1 A	61.8	40
29	30.075	30.04	30.062	75.	78.	3 P	62.	59.	4 A	67.4	30
30	30.07	29.96	30.017	77.	79.	4 P	56.	51.	5 A	66.7	60
31	29.96	29.80	29.857	70.	72.	2 P	61.	57.	12 P	66.5	60

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	0	60.	.6568	79.	N.	146	1	14	9 A	0 A	2 A	.24	
2	0	61.7	.6944	79.7	S.E.	90	$1\frac{1}{2}$	17	8 P	9-15 P	12 P	—	
3	7	65.	.8037	78.7	N.N.W	37	0	—	—	† – A	6-30 A	.65	
4	11	64.7	.8386	74.	S.W.	69	$1\frac{1}{2}$	17	7 P	6 P	6-30 P	.01	
5	6	65.3	.8297	77.	N.W.	47	0	—	—	† – A	8 A	.06	
6	5	60.	.8043	66.7	N.W.	142	$4\frac{3}{4}$	31	1-30 P	4-30 P	5 P	.01	
7	9	59.7	.7978	66.	S.W.	92	$\frac{1}{2}$	10	4 A	—	—	—	
8	14	62.7	.7531	73.3	S.W.	144	$2\frac{1}{2}$	22	1 P	—	—	—	
9	3	71.3	1.0528	75.7	S.W.	175	5	32	5 P	6 P	6-15 P	.065	
10	8	69.	1.0921	66.	S.W.	127	$1\frac{1}{2}$	17	1-30 P	—	—	—	
11	7	72.	1.0976	73.	S.S.W.	143	$3\frac{1}{2}$	26	1-30 P	4 P	12 P	.33	
12	1	65.7	.7729	84.	N.	107	7	37	9 P	0 A	8 P	1.74	
13	0	61.	.7151	76.7	S.W.	88	0	—	—	7 A	8-15 A	.17	
14	7	59.	.6910	74.3	N.W.	60	1	14	2 P	—	—	—	
15	13	60.	.7482	72.7	N.N.W.	62	4	28	3 P	—	—	—	
16	13	60.	.8095	67.7	N.W.	68	$\frac{1}{2}$	10	12 M	—	—	—	
17	13	63.	.8893	67.7	S.S.E	54	0	—	—	—	—	—	
18	13	66.	.9248	73.	S.	65	0	—	—	—	—	—	
19	5	68.3	.9283	76.7	S.W.	117	$7\frac{1}{2}$	39	4-30 P	5-15 P	9-30 P	.74	
20	4	65.	.7778	80.3	S.E.	72	$\frac{3}{4}$	12	7 A	12-15 P	3-30 P	.05	
21	12	59.7	.7906	67.3	N.W.	89	$2\frac{3}{4}$	23	12 M	—	—	—	
22	10	58.3	.7523	62.3	N.	56	$2\frac{1}{2}$	22	1 P	—	—	—	
23	12	55.3	.7151	64.7	E.S.E.	107	1	14	6 P	—	—	—	
24	3	59.	.7453	69.3	S.S.E.	76	$\frac{1}{2}$	10	12 M	—	—	—	
25	0	67.	.7337	90.7	S.E.	190	$2\frac{1}{4}$	21	11-45 A	10 A	12 P	—	
26	0	58.	.5433	89.3	N.N.E.	230	5	32	1-30 P	0 A	12 P	—	
27	0	53.3	.4598	87.3	N.N.E.	248	5	32	10 A	0 A	2 P	4.47	
28	9	54.	.6017	70.7	N.	157	$3\frac{1}{2}$	26	11 A	—	—	—	
29	4	59.3	.7103	73.	N.	78	2	20	9-15 A	—	—	—	
30	7	60.	.6841	79.7	S.	74	$1\frac{1}{4}$	16	10-30 P	—	—	—	
31	1	62.3	.6567	85.7	S.S.W.	180	$3\frac{1}{2}$	26	2 P	11 A	3 P	.01	

†Early morning. T=trace.

REMARKS.

The month was characterized by heavy rainfalls; the showers occurred mostly at night and were accompanied with heavy thunder and brilliant displays of lightning. The amount of precipitation was much above the average. The mean temperature was nearly two degrees above the normal for August, which was due largely to the high temperature for the first twenty-one days of the month. Of the Washington and local forecasts 96.7 per cent. of each were found correct for Amherst.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 45. SEPTEMBER, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.13, 8th, 9 A.
Actual minimum reading,	29.18, 26th, 7-30 A.
Mean reduced to sea level,	30.103
Monthly range,	.95

**Air Temperature.* In Degrees Fahr.

Highest,	76; 80.
Lowest,	40.; 31.
Mean,	60.6; 59.3
Monthly Range,	15.4; 20.7
Highest mean daily,	70.1; 71.
Lowest mean daily,	52.3; 51.
Mean maximum,	69.7; 73.
Mean minimum,	51.2; 45.6
Mean daily range,	18.5; 27.4
Greatest daily range,	30. ; 45.
Least daily range,	5.; 11.

Humidity.

Mean dew point,	51.9
Mean force of vapor,	.5770
Mean relative humidity,	70.7

Wind.

Prevailing Directions.

South,	18 per cent.
South, SouthWest,	17 " "
SouthWest,	13 " "
NorthWest,	9 " "
Other directions,	43 " "
Total movement,	3672 m.
Greatest daily movement,	330 m., 14th.
Least daily movement,	24 m. 9th,.
Mean daily movement,	122 m.
Mean hourly velocity,	5.1 m.

Maximum pressure per square foot, 15½ lbs.= 56 m. per hour, 26th, at 1-30 P.

**Precipitation.* In inches.

Total precipitation,	1.29; 2.16

Weather.

Mean cloudiness observed,	29 per cent.
Number of clear days,	13
Number of fair days,	11
Number of cloudy days,	6
Total cloudiness recorded by the Sun Thermometer,	139 hours or 37 per cent
Number of days on which .01 inch or more rain fell,	5
Frost,	30th.

Bright Sunshine.

Number of Hours recorded,	234

Rain, 6th, 13th, 14th, 19th, 22nd, 23rd, 24th, 26th.

Thunder and Lightning, 26th.

Mean Ozone,	43 per cent.

Halos.

Solar,	4th, 10th, 19th, 21st.
Lunar,	3rd.

Gales, of 35 or more miles per hour, 45, 6th, W. N. W.; 36, 14th, S.; 39, 19th, N.; 56, 26th, W. N. W.; 43, 27th, W. N. W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.125	29.87	29.977	70.	70.5	5 P	55.	48.	12 P	62.7	40
2	30.32	30.125	30.277	69.	72.	5 P	50.	40.	4 A	57.5	50
3	30.34	30.24	30.29	75.	77.	5 P	46.	39.	4 A	61.	40
4	30.24	30.03	30.13	73.	76.5	1 P	52.	46.	5 A	62.	50
5	30.03	29.83	29.90	75.	80.	3 P	51.	46.	6 A	64.7	70
6	30.13	29.805	29.97	68.	71.	1 A	53.	51.	12 P	62.5	50
7	30.29	30.13	30.21	67.	71.	3 P	49.	41.	5 A	58.2	40
8	30.42	30.29	30.377	67.	72.	4 P	47.	40.5	5 A	57.1	40
9	30.41	30.30	30.35	71.	75.5	4 P	46.	40.	5 A	58.4	50
10	30.36	30.31	30.343	72.	74.5	4 P	48.	42.	5 A	59.9	30
11	30.39	30.29	30.345	71.	72.5	5 P	47.	40.	6 A	59.3	50
12	30.31	30.14	30.218	70.	75.	3 P	55.	48.	2 A	62.6	50
13	30.18	29.89	30.05	70.	74.	2 P	56.	51.	2 A	63.2	60
14	29.89	29.66	29.71	69.	73.	2 P	62.	62.	12 P	66.5	70
15	29.94	29.70	29.853	68.	71.	2 P	56.	51.	4 A	61.6	50
16	30.17	29.94	30.033	67.	71.5	1 P	52.	46.	6 A	59.5	40
17	30.285	30.16	30.263	68.	70.	4 P	46.	39.5	6 A	57.2	50
18	30.28	30.01	30.125	75.	79.5	4 P	47.	40.	6 A	61.8	40
19	30.095	29.83	29.928	75.	79.	1 P	55.	55.	12 P	65.3	40
20	30.30	30.095	30.282	66.	68.	4 P	47.	41.	6 A	54.8	50
21	30.35	30.25	30.297	68.	71.	5 P	40.	34.5	5 A	53.5	50
22	30.33	30.27	30.297	65.	67.	4 P	43.	35.	6 A	57.1	30
23	30.31	30.25	30.28	70.	75.5	3 P	62.	59.	4 A	66.4	20
24	30.26	30.085	30.163	71.	74.	1 P	66.	63.	1 A	68.3	40
25	30.085	29.71	29.727	76.	80.	3 P	65.	62.	6 A	70.1	20
26	29.71	29.46	29.53	68.	71.	1 A	55.	51.	11 P	62.2	40
27	29.825	29.63	29.777	62.	62.	5 P	51.	43.	6 A	55.6	40
28	30.13	29.83	29.918	69.	73.	2 P	52.	46.	3 A	60.7	10
29	30.36	30.13	30.287	66.	67.5	4 P	43.	36.	12 P	52.3	30
30	30.35	30.00	30.193	70.	76.	2 P	40.	31.	5 A	57.2	60

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	6	52.3	.5749	70.	N.W.	102	$1\frac{1}{2}$	17	1 P				
2	12	43.	.4760	64.3	N.N.E.	77	$1\frac{1}{4}$	16	7-30 A				
3	12	50.7	.6068	65.	S.S.E.	68	0	—	—				
4	7	56.	.5710	80.7	S.E.	86	1	14	12 M				
5	8	58.3	.6919	74.	S.S.W.	107	2	20	4-30 P				
6	7	48.7	.5473	65.	W.N.W	194	10	45	3 P	† — A	† — A	.47	
7	12	48.3	.5341	66.	S.S.W.	57	0	—	—				
8	12	49.	.5216	69.	S.S.W.	52	0	—	—				
9	10	50.	.5573	68.7	S.W.	24	0	—	—				
10	10	49.7	.5699	65.3	E.S.E.	65	1	14	1-30 P				
11	11	51.3	.5517	73.	S.S.W.	82	$\frac{1}{2}$	10	12 M				
12	5	56.7	.6366	74.7	S.W.	100	1	14	7 P				
13	2	57.	.6184	77.3	S.	170	4	28	3-30 P	10-30 P	12 P		
14	0	65.7	.7015	90.3	S.	330	$6\frac{1}{2}$	36	8 A	0 A	8-30 P	1.59	
15	9	54.3	.5981	72.7	N.W.	93	$2\frac{1}{4}$	21	1 P				
16	9	49.3	.5433	66.	N.W.	148	2	20	3 P				
17	12	46.7	.5216	64.	S.	47	$\frac{3}{4}$	12	4 P				
18	8	56.3	.6602	72.7	S.W.	119	$3\frac{1}{4}$	25	1 P				
19	6	56.	.6533	74.	S.	195	$7\frac{3}{4}$	39	6-30 P	5-30 P	5-45 P	.01	
20	12	45.3	.4406	72.7	N.	144	3	24	1 A				
21	9	46.3	.4694	72.3	S.W.S.	70	$\frac{1}{2}$	10	12 M				
22	2	51.7	.5295	75.	S.W.	77	$\frac{1}{2}$	10	1-30 P	4 P		T	
23	1	62.	.6987	81.3	S.W.	135	1	14	3 P	12-30 P		T	
24	0	65.7	.7435	84.7	S.S.W.	157	$\frac{3}{4}$	12	1-30 P	8-45 A	2-15 P	T	
25	4	65.3	.7757	82.7	S.S.W.	75	$\frac{1}{2}$	10	10 P	† — A	8-30 A	.09	
26	4	46.	.5443	59.3	W.N.W	306	$15\frac{1}{2}$	56	1-30 P				
27	11	37.	.4166	54.	N.W.	240	9	43	9-30 A				
28	11	49.3	.5725	63.3	N.W.	167	$5\frac{1}{4}$	32	10-30 A				
29	11	40.7	.4404	59.3	N.N.E.	79	$1\frac{1}{2}$	17	1-30 P				
30	11	47.7	.5447	63.7	S.W.	106	$\frac{1}{2}$	10	6 P				

†Early morning. T=trace.

REMARKS.

The month was characterized by pleasant weather. Only six days during the month were reported as cloudy. The days were mostly warm and nights cool, but no frosts were observed till the morning of the 30th. The mean temperature was above normal. The rainfall was much below the average. A severe thunder storm occurred on the 26th and several places were struck in Amherst,but no great damage was done. Of the local forecasts 96.3 per cent. and of the Washington forecasts 96.6 per cent. were true for Amherst. The following is a summary for the state, furnished by the New England Weather Service :

The month of September, 1892, will be remembered as unusually free from severe storms and being characterized by generally fair weather, pleasant for all out-door work or recreation. Only four cyclones passed near enough to New England to influence our weather and no West India hurricane reached our coast. Only five anticyclones spread across our district but they moved very slowly and so influenced our weather far more than the cyclones did. The daily temperature ranges were very strong, the days being generally warm and the nights cool, although only light frosts occurred in any part of Massachusetts. The precipitation was below the average and the number of rainy and cloudy days was unusually small. At Boston the total precipitation was 1.16 inch below the average for twenty-two years. At that station also the number of cloudless days was 21, partly cloudy days, 3 and cloudy days 6. A severe thunderstorm passed easterly across southern New England on the 24th and another on the 26th. Mr. Willard Nelson's house in South Monson was struck by lightning and considerable damage was done. The plastering in some of the rooms was torn off, in some cases within a few feet of people lying in bed, the casings and boards were ripped off and in one room all the tacks were taken out on one side and the carpet turned half across the floor. A good deal of damage is reported from Taunton, Mass. Many buildings were struck and several burned. No one was killed although several people had very narrow escapes.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude. 42° 23′ 48.5″ N. Longitude. 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level. 260 ft.

BULLETIN No 46. OCTOBER, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.14, 13th, 8 A.
Actual minimum reading,	29.16, 29th, 2 P.
Mean reduced to sea level,	29.896
Monthly range,	.98

**Air Temperature.* In Degrees Fahr.

Highest,	71. ; 77.5
Lowest,	33. ; 23.
Mean,	50.8; 48.6
Monthly Range,	38. ; 54.5
Highest mean daily,	59.9; 62.
Lowest mean daily,	42.3; 40.
Mean maximum,	57.5; 61.1
Mean minimum,	43.5; 36.1
Mean daily range,	14.1; 25.
Greatest daily range,	25. ; 37.5
Least daily range,	2.5; 12.

Humidity.

Mean dew point,	41.
Mean force of vapor,	.4152
Mean relative humidity,	65.5

Wind.

Prevailing Directions.

North,	18 per cent.
South West,	16 " "
South,	14 " "
North West,	10 " "
Other directions,	42 " "
Total movement,	4071 m.
Greatest daily movement,	276 m., 1st.
Least daily movement,	29 m. 28th.,
Mean daily movement,	131 m.
Mean hourly velocity,	5.4 m.

Maximum pressure per square foot, 12½ lbs.= 50 m. per hour, 6th, at 1-30 P.

**Precipitation.* In inches.

Total precipitation,	.52; .66

Weather.

Mean cloudiness observed,	46 per cent.
Number of clear days,	8
Number of fair days,	11
Number of cloudy days,	12
Total cloudiness recorded by the Sun Thermometer,	163 hours or 52 per cent.
Number of days on which .01 inch or more rain fell,	7

Frost, 6th, 10th, 12th, 13th, 22d, 24th, 25th, 27th, 28th, 31st.

Bright Sunshine.

Number of Hours recorded,	178

Rain, 3rd, 4th, 5th, 9th, 16th, 21st, 26th, 29th.

Mean Ozone,	28 per cent.

Halos.

Solar,	15th, 20th.
Coronae,	2d, 4th, 5th, 6th.

Gales, of 35 or more miles per hour, 48, 1st, N.N.E.; 50, 6th, N.W.; 37, 21st, N.W.; 49, 23d, N.W.; 36, 24th, N.W.; 37, 29th, S.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.17	29.90	30.007	63.	66.	8 A	45.	39.	12 P	57.3	40
2	30.24	30.14	30.188	59.	61.	4 P	42.	31.	5 A	48.3	10
3	30.18	29.62	29.903	54.	62.	9 P	40.	33.	4 A	48.3	10
4	29.62	29.46	29.477	63.	66.	4 P	51.	44.	11 P	56.5	0
5	29.70	29.46	29.547	50.	52.	1 A	42.	37.	11 P	46.5	30
6	29.77	29.70	29.75	54.	55.	2 P	41.	33.	6 A	47.8	0
7	29.82	29.72	29.772	65.	67.	3 P	48.	39.5	1 A	56.7	20
8	29.78	29.66	29.70	69.	71.5	4 P	51.	43.	5 A	60.5	30
9	29.83	29.61	29.673	58.5	62.	1 A	46.	44.	11 P	54.1	50
10	30.03	29.83	29.987	57.	60.5	1 P	37.	28.	6 A	47.7	10
11	30.23	29.995	30.065	65.	69.	2 P	44.	35.5	1 A	52.8	20
12	30.42	30.23	30.373	57.	62.	3 P	38.	30.	6 A	46.5	50
13	30.43	30.21	30.332	63.	69.5	2 P	38.	32.	4 A	51.6	50
14	30.21	29.99	30.05	71.	77.5	2 P	49.	44.	5 A	58.9	40
15	30.13	29.98	30.033	67.	70.5	3 P	45.	37.	5 A	57.4	40
16	29.98	29.82	29.87	66.	72.	2 P	57.	52.	3 A	59.9	60
17	30.16	29.94	30.133	56.	59.5	1 A	50.	47.	12 P	54.3	40
18	30.16	29.955	30.11	54.	56.	5 P	47.	41.	5 A	51.4	50
19	29.955	29.70	29.777	62.	65.5	4 P	50.	43.5	11 P	56.	50
20	29.97	29.82	29.95	58.	59.5	12 M	48.	39.	6 A	52.9	30
21	29.96	29.92	29.937	56.	58.	11 A	47.	39.5	5 A	51.2	50
22	30.03	29.88	29.937	60.	65.5	2 P	45.	33.5	6 A	52.8	0
23	29.88	29.64	29.703	57.	60.	1 P	43.	34.	8 A	50.3	20
24	29.825	29.71	29.807	49.	51.5	3 P	40.	32.	12 P	44.8	20
25	29.83	29.77	29.802	53.	57.	3 P	34.	23.	6 A	43.6	10
26	29.78	29.70	29.737	44.	46.	12 M	41.5	34.	12 P	42.7	20
27	29.79	29.70	29.733	50.	53.	12 M	38.	32.	5 A	44.6	0
28	29.87	29.78	29.81	53.	58.	2 P	33.	25.5	7 A	42.9	10
29	29.78	29.45	29.537	48.	52.	2 P	36.	28.	2 A	42.3	10
30	30.115	29.53	29.935	49.	53.	1 P	41.	35.	12 P	46.6	50
31	30.19	30.09	30.137	53.	56.	2 P	40.	29.5	4 A	47.	40

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	9	45.	.5159	59.3	N.N.E.	276	11½	48	12 M				
2	11	34.3	.3492	60.	N.	143	5½	33	9-30 A				
3	0	39.	.3604	65.3	S.	133	½	10	1-30 P	12 M	8-30 PM	T	
4	1	48.7	.4723	73.3	S.S.E.	116	2	20	4-30 P	† — A	7-15 A	.02	
5	0	38.7	.3161	74.3	N.	168	4½	30	1 P	† — A	1 P	.09	
6	11	34.3	.3533	57.3	S.W.	222	12½	50	1-30 P				
7	9	43.7	.5112	58.	S.W.	190	4¼	29	1 P				
8	7	54.	.5695	77.	S.W.	110	½	10	2 P				
9	1	45.3	.4186	73.3	N.	171	4¾	31	7-30 P	† — A	9-30 A	.21	
10	11	35.	.3492	63.7	S.W.	93	3½	26	2 P				
11	10	44.	.4711	64.3	S.S.E.	109	2¾	23	1-30 P				
12	7	38.3	.3713	64.3	N.	47	—	—	—				
13	10	49.7	.5278	73.7	S.W.	75	¾	12	4 P				
14	8	54.7	.6339	72.7	N.W.	89	2½	22	1-30 P				
15	7	50.7	.6039	62.3	S.	67	1¼	15	12 P				
16	5	54.	.5775	73.	S.	155	2¾	23	2-30 P	† — A	† — A	.18	
17	2	47.	.4179	77.7	N.	149	3¼	25	10 A				
18	0	49.	.4647	75.3	S.W.	95	1½	17	7 P				
19	3	46.3	.4628	69.7	S.W.	223	4	28	6-30 P				
20	8	38.	.3899	59.	N.W.	97	2½	22	1 P				
21	3	37.7	.3772	60.	N.W.	147	7	37	10-30 A	12 M	1 P	.01	
22	10	38.3	.4446	53.3	N.W.	141	4¾	31	10-30 A				
23	9	34.	.3680	55.	W.N W.	184	12	49	12-30 P				
24	9	29.7	.2826	58.7	N.W.	194	6½	36	1-30 A				
25	6	31.	.3013	60.7	N.	55	1	14	8 P				
26	0	36·7	.2845	78.	N	105	½	10	1 P	7 A	4 P	.01	
27	6	37.	.3322	66.	N.N.W	65	0	—	—				
28	7	32.	.3202	61.	S.W.	29	0	—	—				
29	1	38.	.3326	71.3	S.W.	92	7	37	5 P	6-45 A	3 P	.14	
30	3	33.7	.3103	62.7	N.W.	201	5¼	32	3 P				
31	4	33.	.3825	51.3	S.W.	130	1	14	2 P				

†Early morning. T=trace.

REMARKS.

The month was characterized by a large amount of sunshine, low humidity, and very light rainfall—the latter being 3.25 inches below normal. The temperature was 2.5° above normal. The first frost of the month occurred on the 6th and the ground was slightly frozen on the morning of the 10th.

Ninety-three and six tenths per cent. of the local forecasts and ninety-six and eight tenths per cent. of the Washington forecasts were found to be correct for Amherst.

Following is a summary furnished by the New England Weather Service:

The month of October, as observed in Massachusetts was unusually warm and dry. The mean temperature at Boston was 1.2° above the average for 21 years. It was above the normal on the 1st, 4th, 7th to 9th, 11th, 13th to 16th, 18 to 23d, and at or below the normal on the other days. The 14th was the warmest day in most districts, while at Boston it was 14° above the normal. Killing frosts have occurred at most stations but no general freeze has been experienced and many wild plants are green, and the mild weather has caused some to blossom much out of season.

The precipitation was generally light and rain is greatly needed. Wells and streams are very low and the fall sown seed suffers considerably. At Boston the total rainfall was 1.97 inch below the average for the month in other years. More than half of the whole amount recorded at that station fell in the storm of the 4th-5th. At Mansfield heavy rain fell with the passage of the thunder-storm on the 16th, but no damage was done. Hail accompanied this shower at Salem in light quantities.

The weather was controlled by the passage of six cyclones and the same number of anticyclones. Two of the cyclones passed easterly to the north of New England and the others passed across from west to east. This northerly trend of the storms, thus causing warm southerly wind during their passage, probably explains the high temperature. No West India hurricane reached our coast during the month, although at least one passed up the Gulf Stream far out to sea. The number of rainy days was small and there was an excess of sunshine.

C. D. WARNER, Meteorologist.
FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 47. NOVEMBER, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.14, 27th, 10 A.
Actual minimum reading,	29.16, 18th, 6 P.
Mean reduced to sea level,	29.988
Monthly range,	.98

****Air Temperature.*** In Degrees Fahr.

Highest,	64. ; 67.
Lowest,	20. ; 14.
Mean,	39.3 ; 37.8
Monthly Range,	44. ; 53.
Highest mean daily,	56.9; 57.5
Lowest mean daily,	26.1 ; 23.5
Mean maximum,	43.8 ; 46.6
Mean minimum,	34.1 ; 29.1
Mean daily range,	9.8; 17.5
Greatest daily range,	21. ; 31.
Least daily range,	2. ; 9.

Humidity.

Mean dew point,	32.1
Mean force of vapor,	.2783
Mean relative humidity,	71.

Wind.

Prevailing Directions.

North West,	22 per cent.
North North East,	14 " "
North,	13 " "
South West,	12 " "
Other directions,	39 " "
Total movement,	5231 m.
Greatest daily movement,	434 m., 30th.
Least daily movement,	25 m. 12th.,
Mean daily movement,	174 m.
Mean hourly velocity,	7.3 m.

Maximum pressure per square foot, 16 lbs.= 56 m. per hour, 18th, at 5-45 P.

****Precipitation.*** In inches.

Total precipitation,	3.45 ; 4.98

Weather.

Mean cloudiness observed,	58 per cent.
Number of clear days,	8
Number of fair days,	5
Number of cloudy days,	17
Total cloudiness recorded by the Sun Thermometer,	183 hours or 62 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	12

Bright Sunshine.

Number of Hours recorded,	110

Rain, 1st, 2nd, 3rd, 4th, 5th, 7th, 9th, 10th, 15th, 16th, 18th, 21st.

Snow, 5th, 9th, 10th, 28th, 29th, 30th.

Mean Ozone, ... 35 per cent.

Halos.

Solar,	9th, 24th.
Lunar,	8th.
Corona,	3rd, 30th.

Gales, of 35 or more miles per hour, 36, 3rd, N. W.; 55, 5th, N. W.; 40, 7th, S. W.; 42, 8th, S.W.; 35, 11th, N.E.; 37, 16th, S.W.; 56, 18th, S.S. E.; 40, 22nd, N. W.; 38, 25th, N. W.; 45, 29th, N.; 46, 30th, N. N. E.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.23	30.06	30.108	50.	51.	1 P	42.	36.5	12 P	47.2	40
2	30.29	30.05	30.173	41.	48.	1 A	38.	34.	5 A	38.3	30
3	30.05	29.77	29.843	50.	53.	4 P	38.	35.	1 A	43.4	30
4	29.81	29.61	29.71	47.	48.	2 P	39.	32.	6 A	43.4	50
5	29.85	29.57	29.67	44.	46.	1 A	31.	25.5	12 P	36.7	40
6	30.07	29.85	29.99	44.	48.	4 P	30.	22.	1 A	36.5	50
7	30.08	29.91	30.043	57.	59.	12 P	36.	28.	5 A	46.1	40
8	30.12	29.82	29.91	59.	61.	8 A	42.5	36.	12 P	53.6	50
9	30.32	30.12	30.27	43.	44.	12 M	35.	31.5	12 P	40.5	20
10	30.30	29.71	29.833	37.	39.	10 P	33.5	29.5	7 A	34.5	60
11	30.03	29.79	29.99	36.	41.5	1 A	28.5	23.	12 P	33.	50
12	30.11	30.02	30.04	38.	37.	1 P	26.	19.5	3 A	33.1	50
13	30.35	30.11	30.297	42.	48.5	3 P	30.	23.	8 A	36.4	0
14	30.35	30.21	30.267	48.	50.	3 P	34.	37.	5 A	42.4	10
15	30.22	29.99	30.147	53.	55.	7 P	45.5	40.5	7 A	48.9	0
16	29.99	29.60	29.68	58.	61.	11 A	53.	49.	1 A	54.8	50
17	30.03	29.73	29.983	57.	62.	3 P	45.	39.	7 A	52.4	40
18	30.03	29.44	29.707	64.	67.	12 M	44.5	48.	12 P	56.9	40
19	29.75	29.61	29.697	47.	54.	3 P	37.	31.	11 P	41.8	30
20	30.17	29.73	30.033	44.	47.	2 P	31.	23.	5 A	36.4	30
21	30.18	29.97	30.047	44.	44.	2 P	30.	21.5	4 A	37.2	40
22	29.97	29.91	29.943	40.	40.	1 A	29.	25.	11 P	35.8	50
23	29.92	29.78	29.823	29.	32.	1 A	25.	20.	11 P	28.	20
24	29.82	29.78	29.789	30.	33.	1 P	20.	14.	7 A	26.1	40
25	30.07	29.82	29.91	34.	37.	1 P	24.	18.	2 A	29.9	30
26	30.28	30.07	30.197	36.	41.	3 P	29.	27.	12 P	32.7	40
27	30.44	30.28	30.407	34.	34.	3 P	27.	20.	3 A	30.9	20
28	30.41	30.175	30.227	39.	41.	1 P	33.	27.	1 A	35.6	30
29	30.175	29.97	29.893	37.	38.	2 P	34.	29.	7 A	35.5	30
30	29.97	29.87	30.07	33.	37.	0 A	31.	27.	10 A	31.5	40

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	0	38.3	.3407	69.3	N.	118	2	20	5 P	10 P	12 P	—	—
2	0	35.7	.2413	86.3	N.	127	¾	12	0 A	0 A	12 P	—	—
3	0	40.7	.3396	75.7	N.W.	64	6½	36	6 P	0 A	1 P	.53	—
4	0	39.3	.3251	75.3	S.	63	0	—	—	12-15 P	9-30 P	.29	—
5	4	22.	.1780	66.7	N.W.	326	15	55	10 A	1 P	1-15 P	—	T
6	9	25.7	.2803	52.7	N.	131	1¾	18	2 P	—	—	—	—
7	0	44.3	.3926	76.7	S.W.	183	8	40	11 P	12-30 P	9-30 P	.04	—
8	9	36.7	.4011	57.3	N.W.	281	9	42	1 A	—	—	—	—
9	1	30.3	.3150	53.7	N.W.	158	3	24	1 A	8-45 P	12 P	—	—
10	0	31.7	.2035	89.7	N.	142	2¾	23	10 P	0 A	3 P	1.71	2½
11	9	23.7	.1781	74.7	N.N.E.	200	6¼	35	11-30 A	—	—	—	—
12	2	29.	.2353	73.	S.W.	25	0	—	—	—	—	—	—
13	9	30.	.2580	67.3†	W.	40	0	—	—	—	—	—	—
14	3	41.	.3703	70.	S.W.	168	3	24	2-30 P	—	—	—	—
15	0	47.7	.4172	79.3	N.E.	72	1¾	18	9 P	10 A	12 P	—	—
16	0	51.3	.4608	82.3	W.N.W	251	7	37	7-30 P	0 A	7-30 P	2.06	—
17	9	46.7	.4619	69.7	S.	173	1¾	18	9 P	—	—	—	—
18	0	53.	.4997	81.	S.S.E.	383	16	56	5-45 P	1-20 P	7-30 P	.27	—
19	9	31.	.3095	65.7	W.S.W.	115	3½	26	3-30 P	—	—	—	—
20	9	25.7	.2312	62.7	N.W.	99	3½	26	3-30 P	—	—	—	—
21	2	30.3	.3035	56.7	S.W.	93	2½	22	1-30 P	2-15 P	4 P	T.	—
22	7	18.3	.1856	55.	N.W.	279	8	40	9-30 A	—	—	—	—
23	7	18.	.1456	69.3	N.W.	222	4½	30	12 M	—	—	—	—
24	9	20.7	.1455	77.	N.W.	216	5½	33	1 P	—	—	—	—
25	5	21.	.1658	69.7	N.W.	150	7¼	38	10 P	—	—	—	—
26	7	24.3	.1807	73.7	N.	217	4½	30	9 A	—	—	—	—
27	0	25.7	.1890	74.7	N.N.E.	82	½	10	7 P	—	—	—	—
28	0	27.3	.2239	65.7	N.E.	125	3	24	9 P	3-30 P	—	—	T
29	0	25.	.1983	69.	N.	294	10	45	10 P	2-30 P	12 P	—	—
30	0	27.7	.1707	89.7	N.N.E.	434	10½	46	2 P	0 A	10 P	.08	2

†Early morning. T=trace.

REMARKS.

Snow appeared on the surrounding hills on the 5th; the ground was frozen on the 6th for the first time; the total snow fall was 4 1-2 inches but little remained on the ground at the close of the month. Several gales of wind occurred, the greatest damage being done on the 18th when Appleton Cabinet, at Amherst College was unroofed; also a part of the Levi Dickinson box factory; considerable damage was done in several other places along the Connecticut Valley. The rainfall was above normal and the temperature about 1° below. Both Washington and local forecasts were correct to 96.6 per cent.

The following summary is furnished by the New England Weather Service:

The weather for Massachusetts for the month of November was influenced by the passage of nine cyclones and eight anticyclones. Of the cyclones five passed easterly to the north of Massachusetts, two moved from south to north directly across the state, and two passed up our eastern coast. Most of the areas of high and low pressure were well marked and exerted a strong control on our weather and temperature. A sharp fall of pressure occurred on the 10th and again on the 16th with a correspondingly sharp rise on the 17th. Peculiar fluctuations occurred at 5 P. M. on the 10th and between 6 and 8 P. M. of the 18th, marking the central passage of the cyclones of those dates.

The mean temperature at Boston was about 1°.5 below the normal of the month. During the first half of the month the daily mean fluctuated above and below the normal, but from the 14th to 19th it was above, and from the 20th to the end of the month it was below. High temperatures occurred on the 8th, 17th and 18th, while the minimum for the month was generally recorded on the 23d or 24th. Neither the daily nor the monthly ranges were large. This small range has been beneficial to grass and fall sown grains as the ground has not been covered by snow. From a trace to three inches of snow fell in some of the eastern counties on the 5th, and about the same amount in the western part of the state on the 9th-10th but the ground not being frozen in either case it quickly melted. From two to six inches fell again on the 29th-30th, and as the ground was well frozen by the recent cold snap, it bids fair to remain for several days.

The rain that was badly needed at the first of the month came in copious quantities and the ground is now well filled. The fall on the 9th, 10th and 16th was very heavy. The storm of the 18th gave extremely high winds in the Connecticut valley doing considerable damage.

The storm of the 29th-30th was the most severe of the season. It came up our eastern coast and gave high northeasterly gales doing considerable damage to shipping and coast property. At 8 P. M. of the 29th the wind was blowing at the rate of 60 miles an hour at Block Island.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude. 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 48. DECEMBER, 1892.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.23, 12th, 8 A.
Actual minimum reading,	29.22, 25th, 12 P.
Mean reduced to sea level,	30.01
Monthly range,	1.01

****Air Temperature.*** In Degrees Fahr.

Highest,	41. ; 46.
Lowest,	5. ; -1.
Mean,	28.5; 26.3
Monthly Range,	36. ; 47.
Highest mean daily,	38.6; 37.7
Lowest mean daily,	9. ; 10.
Mean maximum,	33.5; 35.4
Mean minimum,	23.8; 17.3
Mean daily range,	9.7; 18.1
Greatest daily range,	21. ; 33.
Least daily range,	1. ; 6.

Humidity.

Mean dew point,	20.5
Mean force of vapor,	.171
Mean relative humidity,	70.3

Wind.

Prevailing Directions.

North West,	24 per cent.
North,	13 " "
North North West,	12 " "
South West,	11 " "
Other directions,	40 " "
Total movement,	4522 m.
Greatest daily movement,	333 m., 24th.
Least daily movement,	20 m. 10th,.
Mean daily movement,	145 m.
Mean hourly velocity,	6. m.

Maximum pressure per square foot, 13½ lbs.= 52 m. per hour, 1st, at 12 M.

****Precipitation.*** In inches.

Total precipitation,	.56; 1.01

Weather.

Mean cloudiness observed,	45 per cent.
Number of clear days,	9
Number of fair days,	8
Number of cloudy days,	14
Total cloudiness recorded by the Sun Thermometer,	139 hours or 49 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	4
Number of inches of snow on the ground at the close of the month,	0

Bright Sunshine.

Number of Hours recorded,	144

Rain, 6th, 7th, 8th, 14th.

Snow. 1st, 3rd, 14th, 15th, 17th, 19th, 23rd, 25th.

Total fall in inches,	3
Hail,	6th.
Aurora Borealis,	4th.
Mean Ozone,	34 per cent.

Halos.

Solar,	6th, 13th, 16th, 20th, 21st, 31st,
Lunar,	27th, 31st.

Gales, of 35 or more miles per hour, 52, 1st, N.; 36, 4th, N. W.; 37, 11th, N. W.; 47, 20th, N.N.E.; 47, 22nd, N. W.; 45, 24th. N. W.; 48, 25th, N.W.; 47, 26th, N.W.; 37, 27th, N.; 36, 28th, N.N.E.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.86	29.70	29.755	38.	43.	12 M	31.	26.	1 A	33.3	40
2	29.725	29.72	29.72	40.	46.	12 M	32.	26.	1 A	34.9	50
3	29.72	29.55	29.607	39.	40.	8 P	28.	19.	6 A	32.8	30
4	29.71	29.55	29.63	39.	41.	1 A	35.	29.	3 A	36.3	30
5	30.15	29.71	30.033	35.	36.	1 P	26.	20.	12 P	30.4	40
6	30.20	29.945	30.09	35.	33.	10 P	20.	12.	7 A	28.6	20
7	29.99	29.945	29.953	41.	45.	1 P	35.	30.5	1 A	38.	40
8	29.99	29.80	29.89	39.	38.	1 A	36.	31.	7 A	36.7	40
9	29.98	29.80	29.887	41.	45.	12 M	35.	30.	12 P	38.6	20
10	30.175	29.98	30.072	35.	37.	1 P	31.	24.	4 A	33.4	30
11	30.44	30.105	30.31	38.	40.	1 P	30.	24.	4 A	33.8	30
12	30.53	30.44	30.482	35.	37.	1 P	29.	22.	7 A	32.5	60
13	30.47	30.35	30.41	38.	37.	2 P	30.	21.5	7 A	34.5	30
14	30.35	30.01	30.057	33.	33.5	1 A	32.	27.5	3 A	32.3	40
15	30.07	30.05	30.06	40.	39.5	1 P	33.	30.	1 A	37.	40
16	30.11	30.07	30.097	39.	39.	2 P	30.	22.	6 A	34.2	20
17	30.10	29.975	30.033	39.	39.5	1 P	30.	23.5	6 A	34.7	50
18	30.00	29.975	29.985	35.	37.	3 P	24.	15.	8 A	31.	40
19	29.98	29.87	29.91	40.	40.	12 M	35.	28.	1 A	36.7	20
20	30.00	29.77	29.847	37.	38.5	1 A	20.	13.5	10 P	30.3	20
21	30.22	30.00	30.187	31.	30.	2 P	17.	7.	3 A	24.	30
22	30.18	30.11	30.143	25.	28.	1 A	19.	13.	11 P	22.4	50
23	30.11	29.82	29.96	23.	24.	1 P	7.	9.5	9 P	17.8	40
24	29.82	29.65	29.667	13.	24.	3 P	5.	0.	10 A	9.	20
25	29.685	29.52	29.615	26.	24.5	1 P	12.	8.5	1 A	20.6	40
26	29.86	29.53	29.728	12.	20.	2 P	7.	0.	8 P	10.	40
27	30.03	29.86	29.958	28.	32.	3 P	7.	–1.	1 A	17.	40
28	30.21	30.03	30.117	22.	25.	3 P	11.	6.	5 A	16.5	30
29	30.36	30.21	30.313	31.	35.	3 P	12.	6.5	7 A	21,2	50
30	30.45	30.36	30.40	32.	38.	2 P	13.	7.	5 A	21.4	30
31	30.37	30.19	30.24	29.5	33.	3 P	15.	6.	1 A	22.1	10

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
												TOTAL IN INCHES.	
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	SNOW.
1	3	25.	.1936	72.3	N.	316	13½	52	12 M	2-45 P	11 P	.11	2
2	9	22.7	.2021	62.	N.N.W.	213	5	32	1-30 P				
3	1	27.	.2468	60.3	W.N.W	61	1½	17	8-30 P	10-45 A	1-30 P	T	T
4	5	23.3	.2006	63.	N.W.	224	6¾	38	10-30 A				
5	9	22.3	.1632	72.7	N.N.W.	248	4½	30	1 A				
6	3	21.7	.2303	62.	S.	96	2	20	8-30 A	6 P	12 P		
7	5	35.	.2890	71.	E.S.E.	76	½	10	11 P	0 A	–A	.16	
8	0	36.7	.2415	89.3	N.	125	½	10	1-30 A	6-30 A	8-30 P	.50	
9	3	29.	.2374	67.	N.W.	118	2	20	1 P				
10	0	28.3	.2402	64.3	S.	20	0						
11	9	17.7	.2056	48.7	N.W.	169	7	37	1 P				
12	7	20.	.1949	56.3	W.	137	2¼	21	12-30 P				
13	2	27.3	.2087	74.7	S.E.	32	0						
14	0	31.7	.2069	88.7	N.	63	0			–A	4 P	.24	½
15	0	30.3	.2504	68.	N.W.	95	1½	17	7-30 A	4 P		T	T
16	3	25.	.2056	67.	S.W.	80	½	10	0 A				
17	1	26.	.2174	65.	N.W.	64	0			4 P	4-30 P	T	T
18	7	19.3	.1690	66.	S.S.E.	111	1½	17	12-30 A				
19	2	25.7	.2317	61.	S.W.	181	2	20	2-30 P	2 P			T
20	6	16.	.1466	67.3	N.	195	11	47	12-30 P				
21	4	19.7	.1305	86.3	S.W.	117	2½	22	1-30 P				
22	6	13.3	.1055	80.7	N.W.	265	11	47	2 P				
23	1	4.	.0899	61.7	W.	203	6	34	1-30 P	2-30 P			T
24	5	3.	.0678	79.3	N.W.	333	10	45	2 A				
25	0	18.3	.1133	91.	S.W.	178	11½	48	11-30 P	1 P	7-30 P	T	½
26	9	5.7	.0674	87.3	N.W.	249	11	47	12-30 A				
27	9	11.5	.1129	78.3	N.	105	7	37	8 P				
28	9	10.3	.0896	82.7	N.	275	6½	36	7 A				
29	9	11.	.1270	62.	N.N.E.	80	1	14	4 A				
30	9	10.7	.1259	62.7	N.	69	0						
31	8	19.	.1790	62.3	S.	24	0						

†Early morning. T=trace.

REMARKS.

The month of December was generally cold and dry. The mean temperature was slightly above normal. The rainfall, 2.51 inches below normal. Total snowfall for the month was three inches. There was only a trace of snow on the ground in sheltered places on the 15th and at the close of the month. The local forecast as compared at Amherst was correct to 90.5 per cent; the Washington forecast 88.9 per cent.

The following summary is furnished by the New England Weather Service:

The weather in Massachusetts for the month of December was cold and dry; fair weather has been in excess and the number of rainy days was less than usual. The air pressure was very near the normal with few rapid or marked changes. The amount of precipitation varied from .65 inch at Randolph, and 1.01 inch at Amherst to 1.70 at New Bedford, and 2 16 at Beverly Farms. At New Bedford the fall was 2.37 inches below the average for eighty years. At Boston it was 2.34 inches below; while at the latter station the daily mean temperature was above the normal from the 7th to 17th and below from the 20th to 30th, and for the whole month the temperature averaged 3° per day below the average for 21 years. On the 24th the minimum was at zero while the maximum was only 13°; the mean for this day was 24° below the normal. At New Bedford the monthly temperature was nearly 4° below the normal for 81 years. The snowfall was deficient, not exceeding more than one to two inches, and no more than a trace of snow and ice lay on the ground on the 15th or 31st, so the unusually low temperature from the 20th to 30th probably caused some damage to grass and grain. The Connecticut river was closed for navigation at Middletown, Conn., on the 23d. A flock of wild geese were seen flying south at New Bedford on the 24th. At Concord at 6.50 P. M. on the 27th a meteor was seen in the north at an altitude of 65°, disappearing near the horizon, and increasing in brightness; it was more brilliant than a star of the first magnitude.

C. D. WARNER, Meteorologist.
FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

ANNUAL SUMMARY FOR 1892.

PRESSURE.

In Inches.

Actual max. reading,	30.42, Feb. 27th, 9 P.
Actual min. reading,	28.77, Feb. 12th, 4 A.
Mean reduced to sea level,	26.983
Annual range,	1.65

**AIR TEMPERATURE.*

In Degrees Fahr.

Highest,	93.5, July 27th; 95, June 14th
Lowest,	0.0; -9.5, Jan. 17th
Mean,	48.5; 46.8
Annual range,	93.5; 104.5
Highest mean daily,	82·5, July 26th; 81, July 25th
Lowest mean daily,	9, Dec. 24th; 7, Jan. 27th
Mean maximum,	55.7; 58.1
Mean minimum,	41.1; 35.3
Mean daily range,	14.6; 22.7
Greatest daily range,	34·5; 52.5, Feb. 18th
Least daily range,	1; 6, Dec. 14th

HUMIDITY.

Mean dew point,	39.2
Mean force of vapor,	.4532
Mean relative humidity,	67.7

WIND.

Prevailing Directions.

North West,	14%
North,	13%
South West,	13%
South,	10%
Total movement,	54720 m
Greatest daily movement,	436 m., Mar. 2nd
Least daily movement,	16 m, Jan. 18th
Mean daily movement,	149.5m
Mean hourly velocity,	6.2 m

Max. pressure per sq. ft., 20½ lbs.=64 m. per hr. Mar. 11th at 3-30 P. M.

PRECIPITATION.

Total rain-fall or melted snow,	28.61 in.; 40.345 in.
Number of days on which .01 inch of rain or melted snow fell,	108
Total snow fall in inches,	42½ in.

WEATHER.

Mean cloudiness observed,	49%
Total cloudiness recorded by the Sun Thermometer,	2220 hrs. or 50%
Number of clear days,	123
Number of fair days,	109
Number of cloudy days,	134

BRIGHT SUNSHINE.

Number of hours recorded,	2261
Mean Ozone,	36%

DATES OF FROSTS.

Last,	May 10th
First,	Sept. 30th

DATES OF SNOW.

Last,	April 10th
First,	Nov. 5th

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*The first figures denote readings at top of tower, the second at base.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No 49. JANUARY, 1893.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximumreading,	30.31, 28th, 9-30 A.
Actual minimum reading,	28.79, 2d, 4 A.
Mean reduced to sea level,	29.951
Monthly range,	1.52

**Air Temperature.* In Degrees Fahr.

Highest,	47.5; 50. 2d
Lowest,	–3.; –13. 17th
Mean,	19.; 16.1
Monthly Range,	50.5; 63.
Highest mean daily,	41.8; 40.
Lowest mean daily,	4.7; 1.5
Mean maximum,	24.7; 26.4
Mean minimum,	12.8; 5.8
Mean daily range,	11.9; 20.6
Greatest daily range,	22.; 35.
Least daily range,	3.; 10.

Humidity.

Mean dew point,	13.9
Mean force of vapor,	.1149
Mean relative humidity,	80.2

Wind.

Prevailing Directions.

North,	19 per cent.
North West,	18 " "
South West,	12 " "
North, North East,	9 " "
Other directions,	42 " "
Total movement,	4056 m.
Greatest daily movement,	379 m., 6th.
Least daily movement,	5 m.; 23d.
Mean daily movement,	131 m.
Mean hourly velocity,	5.4 m.

Maximum pressure per square foot, 12 lbs.= 49 m. per hour, 13th, at 1 P.

**Precipitation.* In inches.

Total precipitation,	2.52; 3.33

Weather.

Mean cloudiness observed,	52 per cent.
Number of clear days,	8
Number of fair days,	11
Number of cloudy days,	12
Total cloudiness recorded by the Sun Thermometer,	164 hours or 56 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	13
Number of inches of snow on the ground at the close of the month,	7

Bright Sunshine.

Number of Hours recorded,	130

Rain. 1st, 2d, 28th, 29th.

Snow. 1st, 2d, 5th, 6th, 7th, 9th, 10th, 12th, 15th, 19th, 23d, 24th, 25th, 28th, 31st.

Total fall in inches,	15¼
Mean Ozone,	38 per cent.

Halos.

Solar,	18th, 26th, 31st.
Lunar,	29th.
Coronae,	26th, 27th.

Gales, of 35 or more miles per hour, 44, 2d, N.W.; 36, 3d, N. W.; 42, 6th, N.; 35, 7th, N. W.; 46, 11th, N.N.W.; 49, 13th, N.; 40, 17th, N N.E.; 45, 25th, S.W.; 37, 27th, N. W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.19	29.17	29.767	40.	46.5	10 P	25.	19.	2 A	28.6	50
2	29.495	29.08	29.277	47.5	50.	3 A	36.	30.	8 P	41.8	60
3	29.76	29.495	29.66	36.	34.5	1 A	14.	9.5	12 P	26.6	80
4	29.85	29.77	29.797	20.	22.	1 P	10.	3.	4 A	15.3	10
5	29.78	29.56	29.642	21.	23.	2 P	18.	13.	1 A	18.8	40
6	29.80	29.46	29.57	20.	22.	3 P	13.	9.	12 P	16.7	80
7	29.94	29.80	29.907	24.	26.	2 P	12.	5.	1 A	18.4	70
8	29.93	29.81	29.857	24.	24.	1 P	12.	7.	11 P	19.1	60
9	29.84	29.20	29.527	22.	21.	3 P	11.	3.	1 A	17.7	50
10	29.375	29.11	29.202	22.	23.	1 A	2.	–4.5	12 P	15.4	10
11	29.91	29.375	29.747	10.	11.	2 P	2.	–8.	1 A	5.4	40
12	20.895	29.51	29.65	11.	9.5	1 P	4.	–5.5	1 A	8.5	30
13	29.765	29.50	29.587	13.	15.	1 P	7.	1.	9 P	9.9	40
14	30.05	29.765	30.023	18.	19.	2 P	7.	–1.	1 A	12.9	50
15	30.05	29.84	29.903	15.	16.	1 A	9.	5.	8 A	13.4	10
16	30.29	29.94	30.173	15.	13.	1 P	5.	–4.	7 A	10.4	50
17	30.41	30.29	30.36	17.	20.5	12 M	–3.	–13.	6 A	4.7	20
18	30.46	30.24	30.37	17.	19.	3 P	0.	–10.	9 A	9.3	40
19	30.24	29.89	29.99	22.	26.	2 P	6.	–3.	2 A	13.1	20
20	30.06	29.89	29.977	20.	20.5	12 M	4.	–5.5	7 A	14.1	0
21	30.23	30.06	30.147	23.	28.5	3 P	8.	2.	5 A	14.2	30
22	30.33	30.23	30.26	22.	29.	4 P	2.	6.	8 A	12.	40
23	30.26	30.08	30.137	23.	24.	2 P	9.	0.	1 A	16.8	30
24	30.15	30.08	30.103	34.	32.	2 P	23.5	20.	1 A	28.4	40
25	30.185	29.87	29.997	36.	38.	1 P	27.	19.	1 A	30.5	0
26	30.24	30.06	30.133	36.	36.	3 P	26.	17.	3 A	31.2	50
27	30.52	30.07	30.353	33.	34.	2 A	18.	30.	11 P	28.1	10
28	30.61	30.455	30.553	21.	20.	3 P	15.	9.	2 A	18.2	30
29	30.455	29.99	30.147	36.	38.	10 P	21.	18.	1 A	28.	50
30	30.37	30.15	30.32	35.	39.	1 A	29.	22.	8 A	31.8	40
31	30.45	30.27	30.35	33.	40.	1 P	24.	21.	12 P	30.1	40

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	0	25.3	.1606	81.	N.W.	31	2	20	10-30 P	9-45 A	12 P		
2	0	26.5	.2268	64.7	N.W.	258	9½	44	3 P	0 A	7-15 P	2.24	1
3	3	7.	.1169	55.3	N.W.	247	6½	36	5-30 A				
4	4	9.7	.0921	78.	W.	129	1½	17	0 A				
5	0	17.3	.1058	91.7	N.N.E.	208	4	28	8-45 P	7 A	12 P		
6	0	12.	.0865	90.3	N.	379	9	42	1 P	0 A	1-30 P	.03	¾
7	4	14.3	.1133	77.	N.W.	190	6¼	35	2 A	8 A	8-30 A		T
8	5	11.	.1007	75.3	W.S.W.	181	5½	33	2 P				
9	0	17.3	.1099	90.3	S.S.E.	97	1¼	15	11-30 A	10-30 A	12 P		
10	3	11.3	.1089	82.7	N.W.	103	1¾	18	11-45 A	0	†-A	.30	5½
11	9	-1.3	.0543	81.	N.N.W.	233	10½	46	12 M				
12	0	5.7	.0659	88.7	N.	156	6	34	5-30 P	6 A	4 P		T
13	7	3.	.0637	82.7	N.	236	12	49	1 P				
14	9	12.7	.0912	88.	W.	109	3½	26	2 P				
15	1	9.	.0794	86.	N.	158	2	20	2-30 P	†-A	9 P	.02	½
16	5	5.	.0677	83.7	W.	141	2½	22	12 M				
17	9	5.	.0669	89.7	N.	91	8	40	12-30 P				
18	9	11.7	.1025	86.	W.N.W	50	0						
19	7	13.7	.1014	83.7	S.	30	0			6-30 A	9-30 A		T
20	9	4.	.0755	77.	N.W.	111	0						
21	9	10.3	.0896	82.7	N.	89	0						
22	9	10.	.0897	82.7	S.S.W.	22	0						
23	0	17.3	.1138	90.	N.	5	0			10-30 A	7 P	.03	½
24	0	26.3	.1847	77.	S.W.	25	0			7 A	3-30 P		T
25	2	26.	.1682	75.3	N.W.	122	10	45	3 P	†-A	2 P	.22	3½
26	6	19.	.1776	60.	S.W.	194	4	28	2 P				
27	9	18.3	.1356	76.3	N.N.W.	155	7	37	4 A				
28	0	12.3	.1005	79.7	N.W.	63	1	14	5 A	10-30 A	12 P		T
29	0	28.3	.1902	82.7	N.W.	19	4¾	31	8 P	0 A	5 P	.37	
30	6	21.3	.1772	68.3	W.	145	4¾	31	0 A				
31	5	20.3	.1465	77.3	N.	79	3	24	12-30 P	†-A	9 A	.12	3½

†Early morning. T=trace.

REMARKS.

The month has been one of the coldest experienced for years; the temperature fell below normal on the 4th and did not rise above that point till the 24th; the lowest reading recorded was 13° below zero. The cold was of long duration but during this period the temperature was remarkably uniform, the daily ranges were small and no sudden fluctuations occurred. The frost penetrated the ground to the depth of four feet in many places.

Severe gales were experienced on the 1st and 2d but with few exceptions the month was free from high winds.

The total snowfall was 15 1-4 inches; four inches were measured at the middle of the month and seven inches at its close. The greatest amount of snow fell on the 10th.

The rainfall was about normal.

Boston and Washington forecasts were correct for Amherst as follows: Boston, 95.5 per cent; Washington, 90.3 per cent. On the 21st, 22d and 23d, Boston forecasts were but one-half correct, while the Washington forecasts were found to be one-half correct on the 18th, 21st, 22d, 23d and 31st.

C. D. WARNER, Meteorologist.
FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No 50. FEBRUARY, 1893.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.52, 5th, 10 A.
Actual minimum reading,	28.69, 20th, 1 A.
Mean reduced to sea level,	30.111
Monthly range,	1.83

****Air Temperature.*** In Degrees Fahr.

Highest,	49.; 50. 15th
Lowest,	1.; -4.5 5th
Mean,	25.7; 22.9
Monthly Range,	48. ; 54.5
Highest mean daily,	41.8; 41.
Lowest mean daily,	8.7; 6.7
Mean maximum,	32.7; 33.7
Mean minimum,	18.9; 12.1
Mean daily range,	13.7; 21.7
Greatest daily range,	38. ; 44.5
Least daily range,	1. ; 7.5

Humidity.

Mean dew point,	17.3
Mean force of vapor,	.1463
Mean relative humidity,	74.7

Wind.

Prevailing Directions.

North,	24 per cent.
North West,	22 " "
West North West,	10 " "
South West,	7 " "
Other directions,	37 " "
Total movement,	5242 m.
Greatest daily movement,	387 m., 20th.
Least daily movement,	52 m.; 6th.
Mean daily movement,	187 m.
Mean hourly velocity,	8 m.

Maximum pressure per square foot, 20 lbs.= 63 m. per hour, 3d, at 11-30 P.

****Precipitation.*** In inches.

Total precipitation,	5.75

Weather.

Mean cloudiness observed,	57 per cent.
Number of clear days,	7
Number of fair days,	7
Number of cloudy days,	14
Total cloudiness recorded by the Sun Thermometer,	185 hours or 62 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	15
Number of inches of snow on the ground at the close of the month,	15

Bright Sunshine.

Number of Hours recorded,	111

Rain, 3d, 6th, 7th, 10th.

Snow, 1st, 2d, 4th, 6th, 9th, 10th, 13th, 14th, 17th, 18th, 19th, 22d, 24th, 25th, 28th.

Total fall in inches,	48¾
Hail,	3d, 6th.
Aurora Borealis,	5th, 15th.
Mean Ozone,	38 per cent.

Halos.

Solar,	11th, 12th, 28th.
Lunar,	1st.

Gales, of 35 or more miles per hour, 44, 2d, N.; 63, 3d, N. W.; 52, 4th, N.W.; 36, 5th, N.; 49, 7th, W.; 40, 8th, N.W.; 53, 10th, S. W.; 39, 14th, N.E.; 35, 15th, W. N. W.; 39, 16th, N.W.; 62, 20th, N.W.; 48, 22d, N. 37, 23d, N. N. W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.46	30.32	30.48	26.	29.	12 P	19.	14.	8 A	21.3	50
2	30.45	30.30	30.413	30.	32.	12 M	26.	20.	1 A	28.2	50
3	30.43	29.99	30.123	32.	33.	4 P	23.	18.	6 A	27.2	30
4	30.78	30.20	30.577	25.	33.	1 A	6.	1.	11 P	15.5	40
5	30.83	30.735	30.783	17.	18.	2 P	1.	–4.5	5 A	8.7	80
6	30.735	29.89	30.237	40.	41.	9 P	2.	–3.5	3 A	18.2	10
7	30.45	29.84	30.098	43.	43.	11 A	18.	14.	12 P	33.9	0
8	30.69	30.45	30.64	20.	21.	3 P	12.	6.	7 A	12.2	30
9	30.79	30.285	30.62	31.	30.	3 P	11.	3.	6 A	22.1	50
10	30.285	29.61	29.76	47.	49.5	4 P	28.	22.	1 A	41.8	30
11	30.34	29.94	30.145	39.	42.	1 A	33.	19.	12 P	36.9	70
12	30.65	30.34	30.607	37.	39.	4 P	25.	23.	8 A	31.5	30
13	30.65	30.11	30.367	31.	32.	1 A	30.	24.	3 A	30.4	10
14	30.38	30.12	30.30	43.	49.	4 P	31.	27.	1 A	36.4	80
15	30.13	29.86	29.913	49.	50.	2 P	37.	32.	11 P	41.8	60
16	30.18	29.97	30.02	37.	38.	1 A	25.	26.	12 P	34.2	40
17	30.45	30.00	30.307	23.	32.	1 A	10.	4.	7 A	15.9	30
18	30.00	29.58	29.623	26.	24.	5 A	20.	9.	12 P	23.9	80
19	29.64	29.00	29.453	36.	27.	2 P	20.	11.	2 A	28.	30
20	29.88	29.99	29.467	34.	32.	1 A	8.	2.	11 P	13.2	80
21	30.11	29.88	30.033	26.	28.	4 P	8.5	.5	1 A	17.3	20
22	29.94	29.00	29.28	26.	22.	5 P	20.	14.5	1 A	23.	50
23	29.79	29.50	29.717	30.	32.	2 P	24.	13.	1 A	27.4	10
24	29.85	29.37	29.577	29.	32.	1 A	19.	10.	7 P	24.8	70
25	29.92	29.80	29.847	38.	36.	2 P	16.	2.	5 A	27.3	20
26	30.23	29.82	30.167	32.	33.5	3 P	24.	13.5	6 A	28.	0
27	30.39	30.23	30.327	34.	35.	5 P	19.	12.	7 A	26.4	10
28	30.39	30.02	30.247	35.	32.	3 P	16.	5.	7 A	25.4	10

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
												TOTAL IN INCHES.	
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	SNOW.
1	0	19.	.1278	85.	N.	90	0			†–A	12 P		
2	0	17.	.1556	64.7	N.	208	$9\frac{1}{2}$	44	11-30 A	0 A	†–A	.16	$1\frac{1}{4}$
3	0	18.7	.1610	67.3	N.W.	92	20	63	11-30 P	7 A	10-30 A	.20	
4	9	4.3	.0763	74.3	N.W.	324	$13\frac{1}{2}$	52	1 A	†–A	†–A		T
5	9	3.3	.0657	83.3	N.	174	$6\frac{1}{2}$	36	5 A				
6	0	18.3	.1356	90.7	S.W.	52	$4\frac{1}{2}$	30	9 P	7 A	12 P		$3\frac{3}{4}$
7	2	22.	.1825	71.7	S.	339	12	49	6-30 P	0 A	†–A	.76	
8	9	6.7	.0860	72.3	W.N.W	173	8	40	1-30 A				
9	4	14.	.1422	62.	S.	102	$3\frac{1}{2}$	26	8-30 P	9-30 P	12 P		$2\frac{1}{2}$
10	0	35.3	.2917	73.7	S.W.	250	14	53	5 A	0 2	5 P	1.22	
11	4	21.	.1960	67.7	N.W.	145	$2\frac{1}{2}$	22	1 A				
12	6	24.	.1795	72.7	S.W.	59	$\frac{3}{4}$	12	1-30 A				
13	0	25.3	.1594	87.7	N.	146	5	32	6 P	9 A	12 P		
14	10	28.7	.2399	68.	S.W.	251	$7\frac{1}{2}$	39	5 A	0 A	†–A	.91	$8\frac{3}{4}$
15	3	30.	.2736	64.3	N.W.	287	$6\frac{1}{4}$	35	5 P				
16	4	20.	.1752	63.	N.W.	238	$7\frac{1}{2}$	39	1 P				
17	2	6.	.0846	75.3	N.	198	6	34	2 A	7-30 P	12 P		
18	0	12.7	.1095	76.7	N.	172	$2\frac{1}{2}$	22	8 A	0 A	6 P	.42	5
19	0	22.3	.1509	84.	S.W.	175	6	34	11-30 P	4-30 P	10 P		T
20	3	1.	.0594	79.7	N.W.	387	$19\frac{1}{2}$	62	11 A				
21	10	11.7	.0959	82.3	N.W.	191	5	32	1-30 A				
22	0	16.7	.1195	80.3	N.	348	$11\frac{3}{4}$	48	11-30 A	†–A	4 P	1.52	18
23	4	17.	.1499	63.7	W. N.W	248	7	37	0 A				
24	3	17.	.1218	82.	N.W.	136	$5\frac{3}{4}$	33	1 P	†–A	9 A	.21	$3\frac{1}{2}$
25	5	11.7	.1223	74.7	S.	81	$1\frac{1}{4}$	15	3.30 P	2.45 P	8.30 P	.09	$2\frac{1}{2}$
26	11	17.3	.1400	71.3	N.W.	174	$5\frac{1}{2}$	33	1 P				
27	11	18.	.1483	69.3	N.W.	148	4	28	1 A				
28	2	22.	.1475	84.3	W. N.W	54	2	20	1 A	3 F	12 P	.26	$3\frac{1}{2}$

†Early morning. T=trace.

REMARKS.

The month was characterized by high winds, low temperature and rapid changes in pressure.

A severe storm of wind occurred on the 20th.

Eighteen inches of snow fell the 22nd ; the total amount for the month being 48¾ inches, which is greatly above normal. Six inches of snow was on the ground at the middle of the month ; 15 inches at its close.

The government forecasts were correct for Amherst as follows : Boston 89.6 per cent. Washington 95.2 per cent.

The following is furnished by the director of the New England Weather Service :

The weather for the month througout the state was influenced by a large number of cyclones and anticyclones and they moved with unusual rapidity and energy ; there were ten cyclones and nine anticyclones ; the former predominated in force and time and caused large and very rapid changes in air pressure.

It was a month of unusual disaster to shipping along our coast and a large number of lives were sacrificed to the waves. The storm of the 20th was most severe over western and northern New England and its equal has probably not been seen for years in this section. The amount of snowfall was not great in the south but it was accompanied by extremely low temperature and was driven by a high gale. A large number of cases of suffering and even death have been reported from this storm. It formed over the Lake region and passed eastward directly across our district during the night of the 19th-20th, with a fall of pressure below 29.0 inches.

The mean temperature was from 2° to 5° below the normal for the month. At Boston the daily mean was above the normal on the 1st to 3d, 6th, 7th and 10th to 16th and below on the other dates. The coldest day was the 8th with a mean of only 8° above zero and the warmest was the 15th with a mean of 46°. The precipitation at this station was 2.65 inches above the normal. The total snowfall was 35 inches ; it varied from 30 to over 50 inches throughout the state. From one to two or more feet lay on the ground through the greater part of the month thoroughly protecting all grass and grain crops.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No 51. MARCH, 1893.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.33, 29th, 10 A.
Actual minimum reading,	29.055. 4th, 2 .P
Mean reduced to sea level,	30.065
Monthly range,	1.275

**Air Temperature.* In Degrees Fahr.

Highest,	49, 31st; 52.5, 13th
Lowest,	15, 5th; 4,3rd
Mean,	33.4; 30.4
Monthly Range,	31 ; 48.5
Highest mean daily,	42.5; 41 5
Lowest mean daily,	19.5; 15.3
Mean maximum,	39.7; 40.3
Mean minimum,	26.7; 20.5
Mean daily range,	12.9; 19.8
Greatest daily range,	23. ; 28.5
Least daily range,	3. ; 7.

Humidity.

Mean dew point,	24.
Mean force of vapor,	.1939
Mean relative humidity,	71.4

Wind.

Prevailing Directions.

North,	20 per cent.
North West,	15 " "
South West,	12 " "
North North West,	11 " "
Other directions,	42 " "
Total movement,	5757 m.
Greatest daily movement,	437 m., 10th.
Least daily movement,	75 m.; 26th.
Mean daily movement,	185 m.
Mean hourly velocity,	7.7 m.

Maximum pressure per square foot, 18½lbs.= 61 m. per hour, 15th, at 10-30 P.

**Precipitation.* In inches.

Total precipitation,	2.59; 3.66

Weather.

Mean cloudiness observed,	46 per cent.
Number of clear days,	9
Number of fair days,	7
Number of cloudy days,	15
Total cloudiness recorded by the Sun Thermometer,	199 hours or 54 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	13
Number of inches of snow on the ground at the close of the month,	0

Bright Sunshine.

Number of Hours recorded,	172

Rain. 9th, 11th, 12th, 14th, 15th, 21st, 23d, 24th, 30th.

Snow, 1st, 3d, 4th, 5th, 15th, 22d, 23d.

Total fall in inches,	3¼
Thunder and Lightning.	14th.
Mean Ozone,	45 per cent.

Halos.

Solar,	7th, 14th, 27th.
Lunar,	31st.

Gales, of 35 or more miles per hour. 45, 1st, N.N. W.; 51, 2d, N. W.; 41, 4th, N. N. E.; 40, 6th, N. N.W.; 60, 9th, N.N.E.; 52, 10th, N.E.; 61, 15th, N. W.; 45, 16th, N.W.; 39, 28th, N.; 43, 30th, S.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.03	29.87	29.923	36.	38.	3 P	30.	22.5	1 A	32.4	40
2	29.96	29.86	29.93	31.	31.	1 A	22.	18.	12 P	27.6	50
3	29.97	29.66	29.817	35.	32.	2 P	17.	4.	8 A	28.	30
4	29.66	29.36	29.473	32.	34.	2 P	22.	19.	12 P	28.5	20
5	29.91	29.65	29.835	25.	23.5	5 P	15.	7.	5 A	19.5	30
6	30.09	29.91	30.073	33.	34.	5 P	18.	10.	7 A	26.	60
7	30.07	29.87	29.907	45.	42.5	2 P	24.	14.	3 A	34.5	50
8	30.175	29.965	30.057	46.	45.	2 P	24.5	13.5	7 A	37.2	50
9	29.965	29.65	29.75	43.	44.5	7 P	35.	30.	5 A	39.	50
10	30.48	29.82	30.335	43.	45.	1 A	36.5	31.	12 P	38.7	90
11	30.49	29.99	30.297	38.	38.	3 P	35.	31.	10 A	36.4	50
12	29.99	29.76	29.813	46.5	47.	5 P	36.	32.	1 A	40.8	70
13	30.04	29.89	30.003	48.	52.5	3 P	36.	30.5	12 P	42.5	40
14	30.06	29.71	29.93	48.	50.	2 P	30.	23.	6 A	40.	30
15	29.86	29.58	29.723	38.	41.5	1 A	18.	16.	12 P	29.5	50
16	30.26	29.86	30.097	29.	27.	5 P	16.	10.	4 A	21.	50
17	30.28	30.08	30.19	38.	36.	4 P	19.	11.5	2 A	28.5	10
18	30.24	29.99	30.10	31.	35.	1 P	20.	14.	5 A	26.4	10
19	30.31	30.24	30.28	36.	36.	4 P	15.	8.	5 A	25.6	30
20	30.47	30.32	30.413	43.	41.	5 P	20.	14.	6 A	30.4	40
21	30.35	30.03	30.133	46.	46.	5 P	33.	26.5	1 A	38.9	10
22	30.50	30.17	30.35	41.	42.	12 M	30.	29.	12 P	37.7	70
23	30.60	30.30	30.52	32.	33.	2 P	25.	20.	6 A	28.8	70
24	30.30	29.68	29.865	44.	44.	5 P	30.	25.	1 A	38.1	50
25	30.09	29.68	29.933	46.	46.	10 A	41.	33.5	5 A	43.5	60
26	30.22	30.07	30.14	44.	46.	1 P	33.	28.	11 P	38.9	40
27	30.28	30.19	30.233	42.	45.	3 P	29.	22.	4 A	34.8	50
28	30.49	30.22	30.35	34.	37.	3 P	26.	22.5	12 P	30.2	30
29	30.63	30.49	30.563	44.	43.	5 P	24.	17.	2 A	33.	70
30	30.50	29.87	30.087	44.	45.	2 P	31.	23.	4 A	37.5	40
31	29.93	29.79	29.887	49.	48.5	5 P	37.	30.	1 A	41.7	50

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
												TOTAL IN INCHES.	
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	SNOW.
1	11	23.3	.1690	75.3	N.W.	197	10	45	3 P	0 A	†-A	.14	$\frac{1}{2}$
2	11	14.	.1269	66.7	N.W.	295	13	51	5 A				
3	3	23.7	.1522	84.3	S.	85	0			12-15 P	5 P	.01	$\frac{1}{4}$
4	0	16.7	.1447	67.	N.	233	$8\frac{1}{2}$	41	12 M	†-A	11-30 A	.05	$\frac{3}{4}$
5	0	13.	.1062	77.	N.N.W	243	$5\frac{1}{2}$	33	4-30 P	9 P	9-30 P		T
6	4	17.7	.1317	78.	W.N.W	172	8	40	4 P				
7	3	24.	.2273	58.	S.W.	184	$1\frac{1}{2}$	17	1-45 P				
8	11	26.7	.2437	63.3	S. S. W.	105	2	20	7-30 P				
9	0	34.3	.2386	84.3	N.	187	18	60	10-45 P	†-A	5-30 P	.77	
10	6	28.	.2140	72.	N.E.	437	$13\frac{3}{4}$	52	3 A				
11	0	30.3	.2085	82.	E.S.E.	212	2	20	6 A	4 P	12 P		
12	0	37.	.2930	75.	N.	77	$1\frac{3}{4}$	18	10 P	0 A	10 A	1.18	
13	10	31.7	.2434	85.7	N.	137	4	28	12 M				
14	4	32.7	.2837	70.3	S.W.	85	1	14	11 A	8 P	12 P		
15	3	19.	.1448	76.3	N.W.	318	$18\frac{1}{2}$	61	10-30 P	0 A	10-30 A	1.16	T
16	8	7.7	.1047	62.7	N.N.W.	325	10	45	1 A				
17	8	19.	.1579	70.7	S.W.	122	2	20	5 P				
18	12	17.7	.1382	72.	N. N. E.	173	$4\frac{3}{4}$	31	4 P				
19	12	16.3	.1394	70.	W.	91	3	24	5 A				
20	12	18.	.1844	59.3	S.W.	56	$2\frac{3}{4}$	23	10 P				
21	3	32.7	.2443	76.7	S.W.	204	5	32	10 A	10-45 A	2 P	.07	
22	0	25.7	.2190	64.7	N.N.W.	152	$4\frac{3}{4}$	31	3 P	6-30 P	12 P		
23	0	25.	.1630	85.	N.N.E.	163	$1\frac{1}{2}$	17	1 P	0 A	12 P		$1\frac{3}{4}$
24	0	36.3	.1958	89.3	S.	143	3	24	6-30 P	0 A	10-30 P	.25	
25	7	29.7	.2666	62.7	N.W.	206	$5\frac{1}{2}$	33	8 A				
26	1	28.3	.2425	66.	N.	75	1	14	2 P				
27	10	22.3	.2068	61.3	N.	175	5	32	9 A				
28	12	15.7	.1489	64.	N.	314	$7\frac{1}{2}$	39	9-30 A				
29	12	23.	.1912	61.7	S.W.	141	$2\frac{1}{2}$	22	10 P				
30	3	28.7	.2302	73.	S.W.	249	$9\frac{1}{2}$	43	4 P	4-30 P	7 P	.03	
31	6	26.3	.2519	58.7	N.	201	4	28	1 P				

†Early morning. T=trace.

REMARKS.

The mean temperature was about normal; the coldest days were the 3d, 5th and 19th; the rainfall was slightly above the average while the snowfall was but 3 1-2 inches; at the middle and close of the month the ground was unprotected by snow save in sheltered places; a thunder storm accompanied by lightning occurred during the night of the 14th.

Robins and bluebirds were seen on the 17th.

Boston and Washington forecasts were correct for Amherst 97.5 per cent. and 94.5 per cent. respectively.

The following summary is furnished by the New England Weather Service:

The weather for the month throughout Massachusetts was influenced by 9 cyclones and 8 anticyclones; they moved with moderate rapidity and no very severe storms were noted; several of the cyclones generated secondaries off the coast. The air changes were not rapid with perhaps the exception of the storm which passed across New England from Southwest to Northeast during the night of the 14th and 15th.

The amount of snowfall for the month was small and little remained on the ground on the 31st. The amount of snow was not sufficient to protect crops, but, owing to the equable temperature, it is thought little damage has been done. The frost is coming out of the ground gradually.

The mean temperature was slightly below normal. At Boston, the coldest day was the 5th, with a mean of 17, and the highest daily mean was 48 on the 25th. At this station (Boston) the precipitation was 1.60 below normal.

A thunder storm occurred on the night of the 14th and 15th; it was most severe in the southern part of the state, but distant lightning was seen in the northern districts. At Middleboro, lightning struck the Congregational Church, setting fire to the structure which was totally destroyed. A singular coincidence in connection with this fire is, that 51 years ago in the same month, a former church was burned under the same conditions on the same site.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No 52. APRIL, 1893.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.35, 7th, 5-30 A.
Actual minimum reading,	29.12, 4th, 5 P.
Mean reduced to sea level,	30.086
Monthly range,	1.23

**Air Temperature.* In Degrees Fahr.

Highest,	67, 67.5, 30th
Lowest,	26, 19, 7th
Mean,	44.7; 43.
Monthly Range,	41. ; 48.5
Highest mean daily,	56. ; 53.7
Lowest mean daily,	31.6; 26.
Mean maximum,	53.4; 54.7
Mean minimum,	37.2; 31.3
Mean daily range,	16.2; 23.3
Greatest daily range,	28. ; 38.
Least daily range,	3. ; 10.

Humidity.

Mean dew point,	31.4
Mean force of vapor,	.2993
Mean relative humidity,	64.8

Wind.

Prevailing Directions.

North West,	16 per cent.
North,	14 “ “
South West,	12 “ “
South,	10 “ “
Other directions,	48 “ “
Total movement,	5384 m.
Greatest daily movement,	371 m., 5th.
Least daily movement,	75 m.; 17th.
Mean daily movement,	179 m.
Mean hourly velocity,	7.4 m.

Maximum pressure per square foot, 24½lbs.= 70 m. per hour, 5th, at 1-30 A.

**Precipitation.* In inches.

Total precipitation,	2.20; 4.41

Weather.

Mean cloudiness observed,	55 per cent.
Number of clear days,	5
Number of fair days,	12
Number of cloudy days,	13
Total cloudiness recorded by the Sun Thermometer,	236 hours or 59 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	13
Number of inches of snow on the ground at the close of the month,	0

Frost, 7th, 10th, 11th, 12th, 16th, 17th, 19th, 23d, 26th.

Bright Sunshine.

Number of Hours recorded,	166
Rain,	1st, 3d, 4th, 7th, 8th, 12th, 13th, 14th, 15th, 20th, 21st, 22d, 25th, 27th, 30th.
Hail,	15th, 20th.
Snow,	6th, 7th, 15th, 18th, 20th, 21st.
Total fall in inches,	7
Thunder and Lightning,	8th.
Mean Ozone,	32 per cent.

Halos.

Solar,	10th, 12th, 24th.
Lunar,	2d, 24th, 26th.
Corona,	24th.

Gales. of 35 or more miles per hour, 42, 1st; S.W.; 42,2d, N.W.; 36, 3d, S.W.; 60, 4th, N.W.; 70, 5th, N.W.; 37, 14th, N.N.E.; 56, 15th, N.W.; 39, 16th, N.E.; 44, 18th. N.W; 41, 26th, N.N.E.; 45, 28th, W.; 36, 30th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.93	29.42	29.62	64.	67.	4 P	39.	29.	1 A	49.9	40
2	30.27	29.67	30.08	47.	51.	1 A	32.	29.	12 P	40.2	50
3	30.39	30.19	30.273	47.	48.	2 P	28.	20.	4 A	40.4	30
4	30.19	29.40	29.72	61.	65.5	5 P	42.	37.	6 A	49.7	30
5	30.15	29.66	30.023	54.	54.	4 P	40.	40.	12 P	45.6	40
6	30.64	30.15	30.46	39.	41.	4 P	31.	26.	5 A	36.	20
7	30.65	30.18	30.487	34.	33.	2 P	26.	19.	6 A	31.6	40
8	30.18	29.75	29.897	47.	48.	8 P	34.	30.	1 A	40.9	30
9	30.20	29.86	30.063	56.	57.	4 P	40.	36.	12 P	47.7	50
10	30.25	30.18	30.227	48.	49.	2 P	34.	27.	5 A	43.1	10
11	30.46	30.25	30.38	59.	61.	5 P	35.	25.	5 A	43.3	0
12	30.51	30.38	30.447	58.	59.	2 P	35.	26.	6 A	43.9	10
13	30.38	29.97	30.133	49.	50.	4 P	46.	40.	6 A	47.8	30
14	29.99	29.79	29.907	66.	67.	3 P	39.	38.5	12 P	51.1	20
15	29.94	29.72	29.81	40.	47.	10 A	36.	31.	10 P	38.1	40
16	30.27	29.93	30.20	50.	49.	4 P	35.	28.	5 A	39.9	50
17	30.28	30.05	30.177	48.5	47.	1 P	33.	26.	5 A	40.1	10
18	30.05	29.81	29.877	51.	55.	2 P	35.	28.	1 A	43.2	40
19	30.15	29.95	30.033	54.	54.	4 P	34.	27.	5 A	44.3	10
20	30.26	30.06	30.203	42.	42.	11 A	37.	31.	2 A	38.6	0
21	30.06	29.85	29.88	58.	58.	4 P	37.	31.5	1 A	45.8	70
22	29.85	29.70	29.75	56.	57.	1 P	42.	37.	12 P	49.	60
23	30.03	29.78	29.883	55.	56.	5 P	40.	33.	2 A	46.9	50
24	30.20	30.03	30.153	62.	61.	5 P	42.	38.	1 A	48.9	20
25	30.20	30.05	30.097	58.	59.	5 P	42.	34.	12 P	48.5	40
26	30.49	30.20	30.457	60.	63.	5 P	32.	25.	5 A	43.7	20
27	30.46	30.11	30.237	44.	46.	10 A	39.	33.	7 A	41.4	20
28	30.14	29.94	30.027	65.	67.	4 P	38.	33.	5 A	51.8	50
29	30.01	29.85	29.95	62.	61.	2 P	49.	42.	4 A	56.	40
30	30.24	29.90	30.127	67.	67.5	5 P	44.	40.	6 A	54.3	40

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	8	36.3	.3871	59.	S.W.	179	9	42	3 P	4-15 P		T.	
2	9	19.7	.2145	48.7	N.W.	255	9	42	3 A				
3	2	28.	.2828	56.7	S.	173	6½	36	4-30 P	8 P		T.	
4	2	37.7	.3377	71.	S.W.	136	18	60	11-30 P	†–A	7 P	.08	
5	12	26.	.2941	51.7	N.W.	371	24½	70	1-30 A				
6	10	19.3	.1860	63.	N.	217	5	32	11 A	†–A	7-30 A	.28	2
7	0	27.3	.1681	90.7	S.S.E.	136	1¼	16	11 A	10-45 A	12 P		5
8	1	36.3	.2638	83.	S.S.E.	122	3	24	3 P	0 A	4 P	1.38	
9	13	31.7	.3033	61.	N.	207	4	28	5 P				
10	2	29.	.2784	60.	N.	85	0						
11	13	27.	.3154	55.3	E.S.E.	135	3½	26	8 A				
12	4	29.	.3230	55.2	S.W.	150	6	34	1-30 P	8 P	8-45 P	T.	
13	0	41.	.3399	77.	S.W.	265	5	32	1-30 P	8-30 A	6 P	.05	
14	5	41.7	.4056	75.3	N. N. E.	116	6¾	37	8 P	5 P	12 P		
15	0	30.	.2064	83.	N.W.	212	15½	56	7-30 P	0 A	7-15 P	.87	T.
16	5	28.7	.2368	66.7	N.N.E.	226	7¾	39	11 A				
17	0	31.	.2625	69.7	N.E.	75	1¾	18	5 P				
18	6	27.	.2752	57.	N.W.	233	9½	44	2 P	†–A	†–A		T.
19	6	28.7	.2917	63.3	N.W.	166	5½	33	2 P				
20	0	28.3	.2169	72.3	E.S.E.	188	4½	30	10 P	11-45 A	12 P		
21	8	37.	.3191	71 7	N.W.	197	4	28	2 A	0 A	9-45 A	1.34	T.
22	6	31.3	.3161	58.7	W.S.W.	221	5¾	34	1-30 A	†–A	†–A	.07	
23	7	33.3	.3190	61.3	N.W.	174	5¼	32	2-30 P				
24	13	27.	.3146	48.3	N.	149	3	24	11–A				
25	3	37.	.3250	70.7	S.W.	188	2	20	3 P	6 A	10-30 A	.05	
26	13	20.3	.2704	45.7	N.	238	8½	41	8 A				
27	0	36.3	.2407	89.	S.	139	1½	17	10-30 A	†–A	7 P	.25	
28	8	40.	.4279	64.	S.W.	199	10¼	15	4 P				
29	0	39.7	.4452	56.	S.S.W.	88	0						
30	10	38.7	.4096	60.3	N.	144	6½	36	2 A	†–A	†–A	.04	

†Early morning. T=trace.

REMARKS.

The weather for the month has been cold and backward, snow occurring as late as the 21st; seven inches fell during the month. On the 26th the ground froze to the depth of one inch, but no serious damage was done to fruit buds already started.

The rainfall was above normal and occurred on fifteen days; the total cloudiness was above the average: severe thunder showers were experienced the eighth; the small amount of bright sunshine has retarded vegetation, little plowing has been done and only a few early vegetables planted.

Telegraphic communication and arrangements for displaying flags have been completed. Telegrams from the Weather Bureau are received daily and recorded at the observatory, and weather signals are now displayed from a tall flag-staff on the tower.

Washington and Boston forecasts were correct for Amherst as follows: 88.5 and 94. per cent. respectively—they are based on forecasts made for the twenty-four hours in advance.

The following summary is furnished by the New England Weather Service:

The temperature during the greater part of the month was below normal, and the season backward in consequence. Rain fell on a number of days, but no severe storms, local or cyclonic, were noted. The rainfall, from the scattered reports that have been received at this early date, appears to be nearly the average. Thunderstorms were general in Massachusetts on the 4th and 8th, but were not of unusual severity.

At Boston, the highest daily mean was 59 on the 29th, and the lowest daily mean, 31 on the 6th. The temperature was above normal on the 1st, 2d, 4th, 5th, 8th, 9th, 12th, 13th, 14th, 28th, 29th, 30th, and below on all the other days, with the exception of the 25th, when normal temperature was recorded. The rainfall at this station was 0.50 inch below the average, and amounted to 3.13 inches. Snow fell on the 6th and 7th, but none remained on the ground at 8 P. M. of the 8th, save in sheltered places and forests.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 53. **MAY, 1893.**

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.03, 9th, 7 A.
Actual minimum reading,	28.87, 4th, 2 P.
Mean reduced to sea level,	29.895
Monthly range,	1.16

**Air Temperature.* In Degrees Fahr.

Highest,	90, 87, 11th
Lowest,	38, 30, 8th
Mean,	58.7; 55.8
Monthly Range,	52. ; 57.
Highest mean daily,	72.8; 70.5
Lowest mean daily,	44.2; 43.5
Mean maximum,	67.7; 68.3
Mean minimum,	49.7; 43.3
Mean daily range,	18. ; 25.
Greatest daily range,	36. ; 45.
Least daily range,	5. ; 11.

Humidity.

Mean dew point,	45.7
Mean force of vapor,	.5110
Mean relative humidity,	66.

Wind.

Prevailing Directions.

North West,	14 per cent.
South,	12 " "
South West,	12 " "
East,	11 " "
Other directions,	51 " "
Total movement,	4833 m.
Greatest daily movement,	338 m., 4th.
Least daily movement,	49 m.; 14th.
Mean daily movement,	156 m.
Mean hourly velocity,	6.5 m.

Maximum pressure per square foot, 24¾lbs.= 71 m. per hour, 4th, at 4-30 A.

**Precipitation.* In inches.

Total precipitation,	3.17; 5.02

Weather.

Mean cloudiness observed,	55 per cent.
Number of clear days,	8
Number of fair days,	7
Number of cloudy days,	16
Total cloudiness recorded by the Sun Thermometer,	265 hours or 59 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	17

Frost, 7th, 8th.

Bright Sunshine.

Number of Hours recorded,	188

Rain, 1st, 2d, 3d, 4th, 5th, 6th, 13th, 14th, 16th, 17th, 18th, 23d, 24th, 26th, 27th, 30th, 31st.

Aurora Borealis, 7th.

Thunder and Lightning, 23d, 30th.

Mean Ozone, 32 per cent.

Halos.

Solar,	2d, 10th, 20th, 23d, 25th, 20th.
Lunar,	22d, 28th.

Gales, of 35 or more miles per hour, 37, 3d; N.E.; 71, 4th, N.E.; 46, 5th, W.N.W.; 37, 13th, N.N.E.; 47, 16th, E.S.E.; 46, 21st, N.W; 36, 23d, S.W.; 48, 25th, S.W.; 44, 28th, N.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.28	30.15	30.223	49.	53.	1 A	44.	41.	11 P	46.8	50
2	30.15	29.99	30.047	65.	66.	5 P	42.	38.	2 A	51.5	70
3	30.11	29.90	30.06	50.	53.	1 A	41.	41.	12 P	45.1	50
4	29.90	29.16	29.35	47.	49.	4 P	41.	38.	1 A	44.2	60
5	29.77	29.49	29.68	52.	55.5	5 P	45.	41.	2 A	48.4	40
6	30.02	29.755	29.87	56.	58.	5 P	44.	37.	5 A	50.6	30
7	30.21	30.02	30.123	61.	60.	5 P	40.	32.	4 A	50.6	30
8	30.28	30.21	30.25	69.	68.	6 P	38.	30.	5 A	54.7	10
9	30.32	30.23	30.28	74.	71.5	5 P	45.	36.5	5 A	59.2	20
10	30.29	30.17	30.233	80.	81.	3 P	52.	43.	3 A	65.2	40
11	30.27	30.10	30.183	90.	87.	4 P	54.	42.	4 A	71.8	10
12	30.10	29.87	29.96	83.	85.	3 P	60.	48.	5 A	71.4	0
13	29.88	29.56	29.673	60.	65.	1 A	52.	48.	8 P	55.6	20
14	29.71	29.57	29.637	69.	67.	4 P	50.	45.5	3 A	58.7	50
15	29.84	29.71	29.80	77.	76.	4 P	49.	42.	4 A	64.2	20
16	29.84	29.43	29.677	62.	64.5	12 M	55.	52.	9 P	59.3	40
17	29.43	29.31	29.34	64.	65.	12 M	55.	50.	1 A	59.6	70
18	29.50	29.34	29.38	60.	59.	12 M	53.	47.	4 A	56.1	10
19	29.98	29.50	29.763	59.	61.	4 P	48.	44.5	12 P	53.4	20
20	30.11	29.90	30.017	78.	76.	6 P	44.	35.	5 A	61.5	50
21	29.90	29.69	29.763	81.	82.5	3 P	56.	48.5	5 A	69.5	10
22	29.87	29.76	29.843	81.	81.5	3 P	60.	51.5	5 A	70.	20
23	29.83	29.58	29.70	84.	87.	1 P	61.	54.	4 A	72.8	10
24	30.12	29.64	30.00	72.	69.	5 P	53.	48.	12 P	60.1	50
25	30.12	29.83	29.967	74.	75.	5 P	48.	37.	4 A	63.8	10
26	30.09	29.92	30.057	68.	67.5	2 P	52.	45.5	5 A	59.3	30
27	30.09	29.87	29.997	58.	59.	3 P	53.	48.	6 A	55.1	40
28	29.90	29.81	29.84	63.	64.	3 P	53.	48.	1 A	57.	40
29	29.92	29.82	29.87	74.	69.	4 P	48.	39.	4 A	60.8	40
30	30.10	29.86	29.937	73.	74.	2 P	52.	44.	5 A	61.5	10
31	30.29	30.10	30.223	68.	70.	12 M	54.	49.	3 A	60.7	30

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	0	39.3	.3267	75.	E.S.E.	144	1	14	11 P	†–A	12 P		
2	3	47.	.4211	81.	S.E.	91	½	10	7 P	0 A	7-30 A	.76	
3	0	42.7	.3025	90.	N.E.	131	7	37	11 P	†–A	12 P		
4	0	42.	.3067	89.3	N.E.	338	24¾	71	4-30 A	0 A	12 P		
5	1	38.	.3442	68.3	N.W.	224	10½	46	12 M	0 A	2-15 P	2.50	
6	4	41.7	.3788	66.7	N. N. W	139	4	28	4-30 P	†–A	7-30 P	.04	
7	5	34.7	.3673	57.	N.	176	6	34	1 P				
8	9	38.	.4193	61.7	W.S.W.	55	1	14	2 P				
9	10	41.3	.4508	60.	S.W.	67	1	14	10-30 P				
10	12	42.3	.6608	47.	N.W.	160	2½	22	3 P				
11	14	46.3	.7505	49.3	S.W.	57	½	10	9 P				
12	14	49.	.7803	50.	S.W.	129	2	20	3 P				
13	0	48.3	.3984	85.3	N.N.E.	227	7	37	5 P	5-30 A	12 P		
14	2	50.7	.5088	73.	W.S.W.	49	0			0 A	†–A	.16	
15	8	52.	.5659	69.3	W.	63	2	20	3 P				
16	0	54.3	.4949	85.	E.S.E.	236	11	47	9 P	†–A	12 P		
17	0	49.7	.5151	70.	S.W.	237	3	24	1-30 A	0 A	†–A	.98	
18	0	46.7	.4154	78.3	S.S.W.	150	1¾	18	8 P	†–A	2-30 P	.10	
19	3	37.7	.3874	59.7	N.	225	5	32	3 P				
20	14	46.7	.5619	62.	S.W.	96	3	24	11 P				
21	14	48.	.7764	46.3	N.W.	264	10½	46	1-30 P				
22	14	46.7	.7281	46.7	W.	182	2½	22	2 A				
23	7	61.7	.8202	68.3	S.	250	6½	36	5-30 P	9-45 P	12 P		
24	14	39.	.4535	54.7	W.N.W	228	5	32	5 A	0 A	†–A	.15	
25	14	47.3	.6144	55.7	S.W.	169	11½	48	1-30 P				
26	7	45.	.4928	61.7	N. N. E.	119	2	20	1 A	4-40 P	12 P		
27	0	48.7	.4619	75.7	S.E.	70	2	20	9-30 A	0 A	8-30 P	.24	
28	4	44.7	.4844	62.3	W.N.W	172	9½	44	2 P				
29	6	46.3	.5850	56.3	S.W.	56	0						
30	9	47.7	.5605	62.7	S.S.W.	133	3	24	4-30 P	6 P	8 P	.04	
31	0	53.	.5081	79.7	S.S·W.	196	2½	22	5 P	1 P	3-30 P	.05	

†Early morning. T=trace.

REMARKS.

The average temperature was about normal, but the precipitation was 5.02 inches, 3.96 inches being the mean rainfall for Amherst. High winds were experienced the 4th and 5th, the highest pressure being 24¾ pounds or an actual velocity of 70 miles per hour. Local and Washington forecasts were correct, 91.7 per cent. and 93.7 per cent. respectively for Amherst. These percentages are based on the forecasts for 24 hours ending at 8 P. M. each day.

The following summary is furnished by the New England Weather Service:

The month averaged very nearly normal in temperature but in precipitation an excess was very generally reported. The maximum temperature for the month occurred on the 23d at most places and averaged about 90 degrees; the minimum of from 30 to 40 degrees was reported on various dates, but the morning of the 8th averaged colder than any other during the month. At Boston the temperature was above normal on the 10th, 11th, 12th, and from the 21st to the 25th inclusive and normal or below on other dates. The highest daily mean at that station was 75 degrees on the 23d and the lowest daily mean was 42 degrees on the 2d and 3d.

Very heavy precipitation was reported on the 3d and 4th. At Boston, 2.71 inches fell during the 24 hours ending 8 P. M. of the 4th; at Westboro, Mass., 3.44 inches; and at Worcester, Mass., 2.68 inches. This storm was accompanied by high northeast gales, which attained a velocity of 48 miles per hour at Boston.

The thunderstorm of the 27th was very general, but no damage has been reported at this date. A light storm with some thunder occurred in western sections on the 30th.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 54. **JUNE, 1893.**

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.08, 8th, 8 A.
Actual minimum reading,	29.41, 21st, 5 P.
Mean reduced to sea level,	30.056
Monthly range,	.67

**Air Temperature.* In Degrees Fahr.

Highest,	96, 94, 20th
Lowest,	50, 27th; 41.5, 8th
Mean,	68.4; 66.9
Monthly Range,	46. ; 52.5
Highest mean daily,	83.8; 78.5
Lowest mean daily,	56. ; 54.
Mean maximum,	79.1; 79.7
Mean minimum,	60. ; 54.2
Mean daily range,	19.1; 25.5
Greatest daily range,	32. ; 41.
Least daily range,	2. ; 9.

Humidity.

Mean dew point,	58.3
Mean force of vapor,	.7303
Mean relative humidity,	71.1

Wind.

Prevailing Directions.

North,	16 per cent.
South West,	13 " "
South, South West,	13 " "
South,	9 " "
Other directions,	49 " "
Total movement,	3572 m.
Greatest daily movement,	250 m., 16th.
Least daily movement,	57 m.; 27th.
Mean daily movement,	119 m.
Mean hourly velocity,	4.9 m.

Maximum pressure per square foot, 9 lbs.= 42 m. per hour, 18th, at 2 P.

**Precipitation.* In inches.

Total precipitation,	2.42; 3.32

Weather.

Mean cloudiness observed,	58 per cent.
Number of clear days,	9
Number of fair days,	7
Number of cloudy days,	14
Total cloudiness recorded by the Sun Thermometer,	277 hours or 57 per cent.
Number of days on which .01 inch or more rain fell,	11

Bright Sunshine.

Number of Hours recorded,	209
Rain,	4th, 6th, 13th, 14th, 17th, 22nd, 23d, 24th, 25th, 26th, 29th, 30th,
Hail,	30th
Rainbow,	4th.
Thunder and Lightning,	4th, 6th, 11th, 30th.
Mean Ozone,	28 per cent.

Halos.

Solar,	7th, 14th, 16th

Gales, of 35 or more miles per hour, 42, 18th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.35	30.26	30.303	77.	75.	4 P	55.	49.5	4 A	63.1	50
2	30.32	30.24	30.273	78.	78.	3 P	53.	43.	4 A	64.9	40
3	30.26	30.21	30.247	80.	77.	1 P	64.	59.	1 A	71.3	0
4	30.23	29.98	30.10	73.	75.5	2 P	66.	61.	3 A	69.3	20
5	29.98	29.87	29.93	91.	90.	5 P	67.	62.	2 A	77.1	10
6	29.94	29.765	29.867	86.	90.5	1 P	67.	62.	12 P	76.6	20
7	30.25	29.94	30.15	72.	72.	3 P	59.	57.	12 P	66.9	40
8	30.36	30.25	30.297	81.	81.	4 P	53.	41.5	4 A	68.4	20
9	30.27	30.10	30.177	82.	82.	3 P	60.	50.	3 A	70.1	10
10	30.11	29.95	30.023	88.	88.	5 P	56.	47.	5 A	73.2	20
11	30.06	29.88	29.99	86.	91.	3 P	69.	60.5	5 A	77.6	30
12	30.19	30.01	30.083	82.	80.5	3 P	63.	58.	12 P	70.4	30
13	30.25	30.19	30.227	74.	76.	4 P	62.	58.	2 A	68.1	40
14	30.20	30.02	30.103	84.	83.	4 P	66.	63.	2 A	73.2	20
15	30.02	29.86	29.933	95.	93.	4 P	68.	64.	3 A	77.3	0
16	30.16	30.01	30.143	68.	75.	1 A	58.	57.	12 P	64.4	20
17	30.155	30.01	30.07	58.	61.	6 P	54.	50.	10 A	56.	50
18	30.055	29.93	29.977	86.	86.	6 P	57.	55.	1 A	70.5	60
19	30.17	30.01	30.093	88.	89.5	4 P	65.	57.	5 A	78.8	20
20	30.04	29.87	29.963	96.	94.	5 P	74.	62.	2 A	83.8	10
21	29.92	29.685	29.767	92.	92.	3 P	69.	58.	4 A	80.8	10
22	29.72	29.75	29.737	72.	81.	1 A	56.	54.	12 P	60.9	50
23	29.99	29.74	29.88	58.	63.	1 P	56.	52.	1 A	57.	30
24	30.03	29.96	30.00	77.	79.	4 P	54.	50.	4 A	65.5	60
25	30.02	29.88	29.947	79.	77.	4 P	60.	54.	4 A	67.1	30
26	29.89	29.83	29.85	61.	63.	1 A	56.	54.	12 P	59.	40
27	30.13	29.88	30.027	63.	65.	2 P	50.	43.	4 A	58.4	30
28	30.21	30.13	30.197	79.	74.	5 P	54.	49.	4 A	65.1	20
29	30.24	30.14	30.197	84.	80.5	5 P	54.	47.	4 A	68.1	40
30	30.18	30.08	30.13	84.	80.	5 P	55.	48.	4 A	68.1	10

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	5	54.	.6584	69.7	S.S.W.	149	1	14	4 P				
2	6	56.	.6810	70.3	S.	110	1½	17	5 P				
3	0	62.	.8048	71.3	S.W.	71	1½	17	9 P				
4	0	65.3	.7691	81.7	S.W.	162	3¾	27	1-30 P	†–A	6 P	.45	
5	11	64.7	.9899	64.	S.W.	92	0						
6	4	66.7	.9573	72.3	S.W.	148	3¾	27	2-30 P	3-15 P	7-30 P	.08	
7	9	47.7	.6648	51.	N.W.	126	3	24	11 A				
8	15	52.	.6495	62.7	S.W.	71	2½	22	5 P				
9	10	54.	.7241	60.3	S.S.E.	129	2½	22	5-30 P				
10	15	61.7	.8285	70.3	S.S.W.	97	¾	12	4-30 P				
11	14	64.3	.9409	67.	S.S·W.	136	6	34	5 P				
12	7	57.7	.7125	68.7	N.N.W	115	1	14	4-30 P				
13	0	62.3	.7125	79.7	N.E.	145	0			1-30 P	7-30 P	T.	
14	5	66.7	.8199	81.3	N.	70	½	10	5-30 P	†–A	†–A	.07	
15	13	65.3	.9899	69.	S.W.	61	2	20	12 P				
16	6	48.3	.6079	58.3	N.E.	250	5	32	10 P				
17	0	52.	.4549	86.	N.	189	2	20	5 A	8-20 A	3 P	.46	
18	15	57.7	.8131	63.3	N.	247	9	42	2 P				
19	15	60.3	.9765	57.3	W.N.W	82	1½	17	2 P				
20	15	64.3	1.0732	55.	N.W.	105	2¾	23	1 P				
21	13	63.3	.9897	57.3	S.S.W.	77	0						
22	0	57.	.5175	90.3	N.	145	1	14	5 P	†–A	12 P		
23	0	54.3	.4817	86.7	N.	149	3	24	4 P	0 A	4-30 P	1.63	
24	6	56.7	.5505	78.3	E.S.E.	101	1	14	11 A	1-30 P	1-40 P	.02	
25	3	58.3	.6310	77.	S.E.	117	4	28	7 P	1-50 P	12 P		
26	0	55.	.5173	83.7	E.S.E.	116	1	14	12 M	0 A	4 P	.44	
27	0	54.3	.5014	86.7	E.S.E.	57	¾	12	2 P				
28	5	53.7	.6002	70.7	N.	96	0						
29	7	54.7	.6466	67.3	S.	92	1	14	1-30 P	1-30 P	2-30 P	.02	
30	10	58.	.6431	75.7	S.E.	67	2	20	12 M	12-15 P	1-30 P	.15	

†Early morning. T=trace.

REMARKS.

The month was cool and damp; the temperature and rainfall were both slightly below normal, the mean cloudiness was above normal, thunder and lightning occurred on several dates but no severe storms were noted; the cool weather and deficiency in precipitation have affected the various crops. The following is furnished by the New England Service:

June was below normal in both temperature and precipitation in nearly all portions of New England. In eastern Maine the deficiency in precipitation caused a drought to prevail and the hay crop will fall far below the average in consequence.

At Boston the precipitation was 1.11 in. below normal and the temperature 38 degrees for the month, or an average of about one degree daily. The temperature was above normal on the 1st, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 15th, 19th, 20th and 21st; it was below on all other dates. The warmest days were the 6th and 20th, with a mean of 82°; the coolest the 17th when the average was 54°.

No high winds occurred during the month. Thunderstorms were noted in some portions of New England on the following dates:—3rd, 4th, 6th, 10th, 11th, 12th, 14th, 15th, 17th, 18th, 20th, 21st, 22d, 24th, 25th and 30th. The storms of the 6th and 11th were most general, but were not severe in any locality. The other storms were moderate and experienced only in scattered portions of New England.

An aurora of moderate brilliancy was observed on the 18th.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 55. JULY, 1893.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	29.97, 11th, 8 A.
Actual minimum reading,	29.30, 22nd, 4 P.
Mean reduced to sea level,	29.968
Monthly range,	.67

**Air Temperature.* In Degrees Fahr.

Highest,	90, 90.5, 22nd
Lowest,	51.5, 41. 25th
Mean,	71.4; 68.1
Monthly Range,	38.5; 49.5
Highest mean daily,	80.6; 77.5
Lowest mean daily,	63.7; 57.5
Mean maximum,	81.9; 82.1
Mean minimum,	61.1; 54.2
Mean daily range,	20.8; 27.9
Greatest daily range,	33. ; 39.
Least daily range,	9. ; 13.

Humidity.

Mean dew point,	58.8
Mean force of vapor,	.8003
Mean relative humidity,	64.8

Wind.

Prevailing Directions.

South West,	19 per cent.
South,	15 " "
North West,	12 " "
North,	9 " "
Other directions,	45 " "
Total movement,	3640 m.
Greatest daily movement,	243 m., 27th.
Least daily movement,	33 m.; 17th.
Mean daily movement,	117 m.
Mean hourly velocity,	4.7 m.

Maximum pressure per square foot, 13 lbs.= 51 m. per hour, 26th, at 7 P.

**Precipitation.* In inches.

Total precipitation,	1.77; 2.59

Weather.

Mean cloudiness observed,	44 per cent.
Number of clear days,	10
Number of fair days,	13
Number of cloudy days,	8
Total cloudiness recorded by the Sun Thermometer,	203 hours or 44 per cent.
Number of days on which .01 inch or more rain fell,	11

Bright Sunshine.

Number of Hours recorded,	259

Rain. 1st, 3d, 5th, 8th, 10th, 12th, 17th, 22nd, 23d, 25th, 26th, 29th.

Rainbow, ... 10th, 26th.

Thunder and Lightning, 1st, 3d, 5th, 8th. 10th, 12th, 17th, 18th, 22nd, 25th, 26th.

Mean Ozone, ... 19 per cent.

Halos.

Solar,	22nd, 25th, 28th, 30th, 31st.
Lunar,	28th.

Gales. of 35 or more miles per hour, 39, 3d, S. W.; 39, 6th, N.; 38, 19th, N. N. E.; 36, 22nd, S. W.; 44,23d, N.W.; 51,26th, N.W.; 36, 27th, N. W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.13	30.00	30.063	80.	84.	2 P	58.	50.	4 A	66.6	40
2	30.04	29.92	29.983	88.	86.	4 P	58.	51.	3 A	72.	30
3	29.98	29.86	29.92	82.	81.	4 P	65.	58.	5 A	70.	20
4	30.00	29.89	29.94	79.	83.	5 P	62.	55.	5 A	70.7	20
5	30.04	29.81	29.93	77.	79.	2 P	60.	50.	5 A	68.	20
6	30.09	29.82	29.973	75.	79.	2 P	62.	57.	1 A	69.1	50
7	30.16	30.07	30.113	88.	84.	5 P	55.	52.	4 A	72.	20
8	30.09	29.82	29.923	84.	85.	1 P	66.	60.	4 A	74.8	10
9	30.005	29.80	29.883	81.	83.	3 P	64.	62.	12 P	73.6	50
10	30.17	30.005	30.093	76.	78.	2 P	55.	46.	4 A	66.7	20
11	30.25	30.16	30.20	81.	80.	5 P	53.	45.	5 A	69.3	0
12	30.17	29.99	30.10	80.	81.	11 A	63.	54.	4 A	69.2	0
13	30.00	29.87	29.913	80.	83.	4 P	63.	59.	5 A	70.3	10
14	30.05	29.99	30.027	86.	81.	5 P	59.	53.	4 A	71.7	30
15	30.04	29.83	29.95	78.	79.	12 M	62.	55.	5 A	71.4	0
16	29.83	29.74	29.773	89.	90.	4 P	70.	65.	1 A	80.6	10
17	29.89	29.82	29.873	83.	81.	12 M	66.	57.	5 A	73.9	0
18	29.93	29.86	29.907	89.	89.	3 P	66.	59.	1 A	75.9	10
19	30.15	29.94	30.027	85.	86.	6 P	65.	60.	12 P	74.8	0
20	30.20	30.075	30.137	86.	83.5	4 P	58.	47.5	5 A	71.6	20
21	30.075	29.83	29.94	87.	88.	3 P	59.	49.	5 A	75.6	20
22	29.83	29.56	29.683	90.	90.5	4 P	68.	60.5	12 P	78.9	0
23	29.895	29.65	29.753	71.	73.	7 A	56.	55.	12 P	66.	10
24	30.17	29.895	30.08	73.	73.	3 P	53.	44.	4 A	63.7	20
25	30.21	29.92	30.09	76.	74.	5 P	51.5	41.	4 A	66.5	10
26	29.92	29.68	29.767	86.	87.	3 P	65.5	59.	5 A	74.1	20
27	30.135	29.69	29.94	77.	75.	5 P	61.	62.	11 P	68.3	20
28	30.22	30.13	30.163	82.	81.	3 P	59.	48.	2 A	71.	30
29	30.13	29.91	29.983	75.	75.	5 P	66.	60.	4 A	68.5	40
30	30.01	29.97	29.983	89.	86.	6 P	65.	54.	7 A	74.1	30
31	29.99	29.86	29.923	87.	87.	4 P	60.	52.	5 A	74.7	40

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
												TOTAL IN INCHES.	
		MEAN DEW POINT.†	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	SNOW.
1	5	60.	.7128	75.7	N.	75	$2\frac{1}{4}$	21	3-30 P	1-30 P	6 P	.11	
2	14	59.7	.8006	68.7	S.	50	$\frac{1}{2}$	10	11 P				
3	5	61.3	.8098	68.3	S.W.	135	$7\frac{1}{2}$	39	4 P	4 P	4-30 P	.23	
4	12	56.	.7525	60.7	W.N.W	104	$1\frac{1}{2}$	18	12 M				
5	0	58.	.7510	66.3	S.	148	$4\frac{1}{2}$	30	2 P	8 P	11 P	.63	
6	4	63.3	.7567	78.3	N.	154	$7\frac{1}{2}$	39	11 A				
7	15	56.	.8204	60.3	S.S.E.	54	0						
8	4	64.7	.9230	68.3	S.W.	199	4	28	2-30 P	6 P	7 P	.13	
9	8	57.3	.8309	58.3	N.W.	177	3	25	3-30 P				
10	13	53.7	.9151	58.3	N.W.	65	2	20	5 P	4-15 P		T.	
11	15	53.7	.7409	59.	W.N.W	50	$1\frac{1}{2}$	18	1-30 P				
12	2	57.7	.7784	62.7	W.N.W	74	0			3 P	9-30 P	.29	
13	12	58.7	.7938	64.3	N.	91	$4\frac{1}{2}$	30	3 P				
14	10	58.3	.8133	62.	S.	69	$\frac{1}{2}$	10	10-30 P				
15	3	61.3	.8159	66.3	S.W.	219	5	32	7-30 P				
16	14	65.3	1.0347	62.3	W.N.W	204	$5\frac{1}{2}$	33	3-30 P				
17	0	64.3	.8479	71.	S.W.	33	0			12-45 P	3-30 P	.15	
18	9	65.3	.9548	68.	S.S.W.	52	0						
19	11	54.3	.8684	49.	N.N.E.	144	7	38	2 P				
20	14	54.7	.8098	55.3	N.	97	$\frac{3}{4}$	13	2 P				
21	12	61.	.9209	59.3	W.	124	$3\frac{1}{2}$	27	3 P				
22	6	64.3	1.0184	62.	S.W.	193	$6\frac{1}{2}$	36	1-30 P	6-15 P	10 P	.15	
23	5	50.3	.6242	61.	N.W.	156	$9\frac{3}{4}$	44	4 P	12-30 P	5-30 P	.05	
24	12	49.3	.5767	62.7	N.N.W.	113	$3\frac{1}{2}$	27	11 A				
25	4	56.3	.6292	74.	S.	63	$\frac{1}{2}$	10	2 P	11 A	8-30 P	.17	
26	8	65.3	.8434	76.3	S.	109	13	51	7 P	10-30 A	11 P	.40	
27	14	54.	.6925	61.7	N.W.	243	$6\frac{1}{2}$	36	11 A				
28	9	55.7	.7442	62.7	W.	122	$1\frac{1}{2}$	18	11 A				
29	1	63.	.6782	85.7	S.	188	$2\frac{1}{2}$	22	10 A	6 A	9-30 A	.28	
30	8	59.	.6815	66.	N.	64	1	14	3 P				
31	10	61.	.8702	64.7	S.	51	1	14	7-30 P				

†Early morning. T=trace.

REMARKS.

The rainfall was much below and the temperature slightly above normal. The amount of sunshine was greater and the average humidity much less than usual. Gales and thunderstorms were frequent but no great damage was done in the near vicinity of Amherst. The Washington and Boston forecasts were true for Amherst, 88.3 and 90.2 per cent. respectively. The former is furnished by the New England Weather Service.

The temperature during the month of July averaged about normal, but the precipitation was considerably below the average not only in Massachusetts but throughout New England. At Boston the highest daily mean temperature occurred on the 16th with an average of 79° and the coolest day was the 24th when the mean was 63°. The month was remarkably clear; only five cloudy days were recorded at Boston. The thunderstorms were frequent but of short duration and no serious damage has been reported as yet to this office; they occurred in some portion of Massachusetts on the following dates: 1, 3, 5, 7, 8, 17, 18, 19, 22, 23, 25, 26, 27. In some places wind did damage and several buildings were struck by lightning and burned, but no loss of life occurred although several were stunned by the shock experienced.

The weather has been favorable to the hay crop but vegetation in general feels the need of rain.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 56. **AUGUST, 1893.**

MONTHLY SUMMARY.

Pressure. In Inches.

Actual maximum reading,	30.02, 23rd, 7 A.
Actual minimum reading,	29.09, 29th, 2 P.
Mean reduced to sea level,	30.001
Monthly range,	.93

****Air Temperature.*** In Degrees Fahr.

Highest,	94, 9th ; 96, 10th
Lowest,	52; 39, 14th
Mean,	71. ; 69.2
Monthly Range,	42. ; 57.
Highest mean daily,	78.6; 77.2
Lowest mean daily,	62.1; 59.
Mean maximum,	81. ; 82.6
Mean minimum,	62.2; 55.7
Mean daily range,	18.8; 26.9
Greatest daily range,	32. ; 42.
Least daily range,	3. ; 10.

Humidity.

Mean dew point,	59.9
Mean force of vapor,	.7775
Mean relative humidity,	70.7

Wind.

Prevailing Directions.

North,	17 per cent.
South West,	15 " "
South,	13 " "
North West,	11 " "
Other directions,	44 " "
Total movement,	4126 m.
Greatest daily movement,	467 m., 29th.
Least daily movement,	31 m.; 9th.
Mean daily movement,	133 m.
Mean hourly velocity,	5.5 m.

Maximum pressure per square foot, 37½lbs.= 86½m. per hour, 29th, at 3 P.

****Precipitation.*** In Inches.

Total precipitation,	2.10; 3.49

Weather.

Mean cloudiness observed,	44.8 per cent.
Number of clear days,	12
Number of fair days,	5
Number of cloudy days,	14

Total cloudiness recorded by the Sun Thermometer, . . . 203 hours or 47 per cent.

Number of days on which .01 inch or more rain fell,	13

Bright Sunshine.

Number of Hours recorded,	225

Rain, . . 1st, 5th, 7th, 12th, 17th, 18th, 19th, 20th, 21st, 23d, 24th, 26th, 27th, 28th, 29th.

Thunder and Lightning, 1st, 7th, 12th, 18th, 19th, 26th, 27th.

Mean Ozone, ... 30 per cent.

Halos.

Solar,	4th, 28th.

Gales, of 35 or more miles per hour, 45, 13th, N.; 36 14th, N.; 37, 15th, N.; 40, 21st N.; 66, 24th, E.S.E.; 37, 27th, S.W.; 86½, 29th, S. W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.97	29.83	29.86	83.	81.	6 P	69.	64.5	12 P	75.2	30
2	30.26	29.97	30.16	85.	80.	6 P	63.	56.	4 A	70.7	10
3	30.28	30.14	30.217	88.	86.	5 P	56.	45.	5 A	71.6	40
4	30.18	30.04	30.12	83.	82.	1 P	63.	54.	5 A	74.1	20
5	30.04	29.89	29.937	79.	82.	4 P	64.	59.	4 A	70.9	30
6	29.97	29.84	29.90	86.	84.5	4 P	67.	59.5	1 A	73.7	40
7	29.86	29.76	29.81	72.	77.	2 P	63.	58.	12 P	67.8	20
8	30.12	29.86	29.997	91.	88.	5 P	60.	51.	4 A	73.8	10
9	30.22	30.12	30.17	94.	95.5	5 P	62.	53.5	4 A	77.3	40
10	30.18	30.03	30.107	93.	96.	4 P	64.	55.5	4 A	78.6	0
11	30.07	29.88	29.967	92.	93.	4 P	63.	54.5	5 A	76.5	20
12	29.91	29.79	29.86	88.	92.	2 P	67.	61.	4 A	75.4	30
13	30.15	29.90	30.073	70.	76.5	4 P	58.	58.	12 P	65.9	40
14	30.19	30.07	30.117	77.	79.	5 P	52.	39.	5 A	62.1	60
15	30.07	29.91	29.98	82.	85.	4 P	55.	45.	5 A	70.	20
16	30.00	29.94	29.98	81.	83.	4 P	58.	48.	5 A	70.2	10
17	29.99	29.77	29.863	69.	71.	10 A	66.	60.	2 A	67.2	10
18	29.89	29.77	29.813	76.	80.	4 P	62.	59.	11 P	67.3	30
19	30.045	29.89	30.003	74.	76.	3 P	60.	55.5	5 A	68.	20
20	30.08	30.03	30.057	69.	70.5	12 M	62.	59.5	5 A	66.1	50
21	30.04	29.74	29.84	67.	70.	4 P	62.	57.5	7 A	63.6	60
22	30.24	29.89	30.137	82.	83.	4 P	59.	51.5	5 A	69.9	20
23	30.30	30.19	30.257	82.	83.5	4 P	56.	48.	5 A	70.	10
24	30.19	29.58	29.74	72.	75.	3 P	69.	65.	7 P	70.1	60
25	29.985	29.89	29.943	91.	92.5	4 P	67.	62.	2 A	77.9	50
26	30.08	29.985	30.04	88.	90.5	4 P	70.	64.	5 A	77.6	40
27	30.13	30.03	30.083	85.	90.	2 P	67.	60.	4 A	73.2	20
28	30.09	29.98	30.03	82.	85.	3 P	68.	64.	2 A	74.8	30
29	29.98	29.37	29.67	79.	79.5	3 P	65.	63.	11 P	72.8	50
30	30.18	29.92	30.097	75.	75.	4 P	60.	53.	12 P	66.	50
31	30.22	30.15	30.187	77.	78.5	4 P	52.	44.	5 A	64.2	20

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	3	63.	.8257	71.3	S.	129	0			5-30 A	2-10 P	T.	
2	14	58.3	.7242	68.7	N.	119	$1\frac{3}{4}$	18	4 P				
3	14	56.3	.6488	69.7	S.W.	51	0						
4	4	59.3	.8893	60.7	S.	126	0						
5	8	62.7	.7856	73.6	N.E.	121	1	14	10 A	†–A	8 A	.09	
6	3	66.3	.7802	83.	S.	50	0						
7	6	57.3	.6835	71.	N.	101	$1\frac{1}{2}$	17	1 P	7-30 A	9-30 A	.07	
8	14	61.7	.7735	71.7	N.	133	4	28	10 A				
9	14	57.7	.9935	55.	S.S.E.	31	0						
10	14	62.3	1.0519	59.	S.W.	76	0						
11	9	61.	.9687	61.	S.W.	79	0						
12	1	67.	.9260	78.3	N.	68	$1\frac{1}{2}$	17	3-30 P	2-45 P	11 P	.38	
13	13	45.7	.5745	54.3	N.	314	10	45	7-30 P				
14	13	41.3	.6413	49.	N.	130	$6\frac{1}{2}$	36	1-30 P				
15	11	53.3	.7132	61.3	N.N.E.	101	7	37	6 P				
16	13	57.7	.7124	72.	N.	123	$5\frac{1}{2}$	33	11 A				
17	0	61.3	.6682	80.3	S.	169	$1\frac{3}{4}$	19	10 A	7 A	12 P	.11	
18	2	61.7	.7446	76.7	E.	73	$4\frac{1}{2}$	30	5 P	5-30 P	8-45 P	.01	
19	0	59.7	.6232	79.7	S.E.	67	1	14	9-30 P	10 P	12 P		
20	0	61.	.6768	79.	S.E.	145	$\frac{1}{2}$	10	1-30 P	0 A	1 P	.45	
21	1	57.3	.5679	83.3	N.	227	8	40	1-30 P	6 A	9 A	.01	
22	12	57.7	.7149	69.3	N.W.	79	$\frac{1}{2}$	10	9 A				
23	2	59.7	.7676	69.	S.	61	1	14	4-30 P	12-45 P		T.	
24	0	65.3	.7419	86.	S.W.	413	22	66	9 A	5 A	9-15 P	.46	
25	12	66.	1.0345	67.	S.W.	174	$1\frac{3}{4}$	18	2 P				
26	11	66.7	.9537	71.7	W.	46	0	—	—	†–A	†–A	.13	
27	4	69.	.9599	78.3	S.S.W.	58	7	37	4 P	4-30 P	5-45 P	.38	
28	3	72.3	.9388	85.7	S.S.W.	159	4	28	3-30 P	†–A	†–A	.10	
29	2	63.7	.7483	79.7	S.S.E.	467	$37\frac{1}{2}$	$86\frac{1}{2}$	3 P	5 A	1-15 P	1.21	
30	13	48.3	.6232	56.3	N.W.	182	4	28	4-30 A				
31	9	54.3	.6477	69.	N.W.	54	1	14	12 M				

†Early morning. T=trace.

REMARKS.

Seven cyclones and the same number of anticyclones influenced the weather in Massachusetts during the month of August. Of the cyclones three passed to the north of Massachusetts; one passed easterly across the state, with little energy; one passed up the eastern coast asd two passed northerly across our western edge. The last named were the last three of the month and may all be designated as West India Hurricanes. The first of the series passed to the north well out to sea, striking the coast in the vicinity of Nova Scotia. It caused high winds and heavy rains on the coast on August 21st. Some damage was done both to shipping and to buildings and crops along the coast. The second of the three came up the Middle coast and onto the land near New York City on August 24th. This storm was accompanied by terrific winds and unusual heavy rainfall. Some damage was done to crops in the Connecticut valley by the storm and wind. The last storm ran onto the land near Savannah, S. C. doing terrible damage over the southern states. It passed to the north over New York state and western Massachusetts on the 29th, completing the havoc begun by the preceding storm. Crops suffered severely throughout the Connecticut valley; many fields of tobacco were almost wholly ruined; much of the winter fruit was blown from the trees and not a little damage was done to shade and fruit trees within the storm area. At Amherst the wind pressure recorded was 37½ pounds per square foot, or a velocity of 86½ miles per hour, the greatest ever observed at this place. This did more injury along the coast than the one before. A wind velocity of 70 miles an hour for a minute was recorded at Boston.

The rainfall for the month was two inches above the average at Boston, while the temperature was only slightly so. It was mostly above for the first ten day's of the month, below for the next ten days, and above again at the last of the month. At Amherst the mean temperature was slightly above normal but the rainfall was nearly one inch below the general average. Light frosts were recorded on the 14th and 15th although no serious damage was done.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 57. SEPTEMBER, 1893.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading, . 30.165, 12th, 8 A.
Actual minimum reading, . . 29.36, 16th, 9 A.
Mean reduced to sea level, ... 30.065
Monthly range, ...805

****Air Temperature.*** In Degrees Fahr.

Highest, ... 78, 5th; 81, 10th
Lowest, ... 38; 30, 27th
Mean, ... 58.1 ; 55.8
Monthly Range, ... 40. ; 51.
Highest mean daily, ... 69.5; 63.5
Lowest mean daily, ... 45.9; 43.
Mean maximum, ... 66.4; 69.5
Mean minimum, ... 49.4; 42.2
Mean daily range, ... 17. ; 27.4
Greatest daily range, ... 31. ; 42.5
Least daily range, ... 4. ; 13.

Humidity.

Mean dew point, ... 49.1
Mean force of vapor, ...5075
Mean relative humidity, ... 72.8

Wind.

Prevailing Directions.

South West, ... 24 per cent.
North, ... 13 " "
South, South West, ... 12 " "
South, ... 10 " "
Other directions, ... 41 " "
Total movement, ... 3508 m.
Greatest daily movement, . . . 248 m., 15th.
Least daily movement, ... 33 m.; 27th.
Mean daily movement, ... 116.9 m.
Mean hourly velocity, ... 4.9 m.
Maximum pressure per square foot, 14½lbs.= 54m. per hour, 30th, at 11 A.

****Precipitation.*** In inches.

Total precipitation, ... 1.88; 2.82

Weather.

Mean cloudiness observed, . . . 45.7 per cent.
Number of clear days, ... 8
Number of fair days, ... 8
Number of cloudy days, ... 14
Total cloudiness recorded by the Sun Thermometer, . . . 211 hours or 53 per cent.
Number of days on which .01 inch or more rain fell, ... 7
Frost, ... 3d, 27th, 29th.

Bright Sunshine.

Number of Hours recorded, ... 185

Rain, . . 1st, 7th, 15th, 16th, 19th, 22d, 23d, 25th, 29th.

Thunder and Lightning, 7th.

Mean Ozone, ... 35 per cent.

Halos.

Solar, ... 1st, 21st, 26th.
Lunar, ... 27th.

Gales, of 35 or more miles per hour, 37, 2d, N.W.; 49 7th, N.; 40, 8th, N.N.E.; 37, 16th, S.W.; 39, 17th, S.W.; 54, 30th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.24	30.01	30.14	69.	72.5	1 P	53.	44.	5 A	62.	20
2	30.07	29.87	29.937	68.	71.5	3 P	51.	48.	12 P	61.	30
3	30.09	29.87	30.003	67.	67.5	5 P	46.	33.	6 A	57.3	50
4	29.98	29.94	29.957	68.	68.5	5 P	51.	48.5	12 P	58.5	40
5	29.99	29.79	29.88	78.	80.	4 P	47.	37.5	4 A	63.4	40
6	30.20	29.94	30.04	67.	70.	1 A	49.	43.	12 P	57.1	30
7	30.19	29.81	29.997	66.	70.	3 P	45.	35.5	4 A	55.5	60
8	30.23	29.86	30.063	64.	69.	4 P	50.	47.	12 P	58.	40
9	30.26	30.12	30.19	73.	75.	5 P	44.	35.	5 A	58.7	40
10	30.21	29.99	30.067	75.	81.	4 P	55.	48.5	5 A	64.2	30
11	30.37	30.21	30.333	71.	71.	5 P	50.	46.	12 P	59.5	40
12	30.45	30.37	30.413	71.	73.	5 P	44.	36.	5 A	57.1	30
13	30.43	30.30	30.36	73.	76.	5 P	45.	36.5	6 A	60.	30
14	30.32	30.18	30.24	73.	75.	1 P	61.	56.	4 A	69.5	30
15	30.18	29.87	30.01	71.	75.	12 M	67.	62.	6 P	68.1	50
16	29.87	29.64	29.713	67.	68.	1 A	55.	49.	11 P	62.2	40
17	29.98	29.79	29.90	60.	63.	2 P	52.	47.	12 P	56.	20
18	29.97	29.89	29.953	63.	64.	2 P	48.	41.	4 A	56.6	60
19	29.89	29.72	29.77	70.	74.	5 P	57.	50.5	5 A	62.3	20
20	30.03	29.79	29.90	70.	74.	1 P	56.	49.	12 P	63.3	40
21	30.16	30.03	30.12	64.	67.5	4 P	46.	36.	6 A	54.	40
22	30.12	29.86	29.943	62.	65.	2 P	46.	38.	2 A	55.8	20
23	29.96	29.86	29.913	69.	75.	1 P	54.	44.5	7 A	62.	30
24	30.16	29.91	30.09	64.	69.5	2 P	51.	42.	6 A	57.9	50
25	30.16	29.83	29.967	61.	65.5	6 P	52.	45.	2 A	56.1	40
26	30.38	30.04	30.327	60.	63.5	2 P	46.	36.	6 A	53.4	50
27	30.39	30.31	30.343	54.	56.	3 P	38.	30.	5 A	45.9	0
28	30.31	30.12	30.177	61.	66.	4 P	40.	34.	4 A	49.9	10
29	30.18	30.06	30.113	53.	58.	2 P	39.	30.	4 A	45.9	40
30	30.18	30.00	30.093	59.	62.	4 P	43.	36.	6 A	50.6	30

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	4	56.	.5969	76.3	N.W.	47	¾	12	7 P	7-15 P	9-30 P	T.	
2	7	45.7	.5496	59.7	N.W.	179	7	37	2 P				
3	7	44.	.4999	60.3	S.W.	120	4½	30	2-30 P				
4	13	42.7	.4696	60.3	N.	116	2½	22	8 A				
5	6	56.	.6479	75.3	S.W.	64	4	28	1-30 P				
6	9	52.3	.5081	79.	N.N.E.	148	6	34	12 M				
7	3	50.3	.4879	78.3	S.	94	12	49	7 P	5-30 P	9-15 P	1.32	
8	12	45.7	.4644	69.3	N.N.E.	214	8	40	2 P				
9	12	48.7	.5259	70.	S.W.	73	2	20	7 A				
10	10	53.	.6661	63.7	N.E.	140	2	20	9-30 P				
11	12	45.	.4663	67.7	N. E.	116	0	—	—				
12	9	48.	.5236	67.3	S.S.W.	86	2	20	1 P				
13	9	52.7	.5708	72.7	S.W.	109	½	10	3 P				
14	2	61.7	.7162	78.3	S.W.	128	1½	17	2 P				
15	0	65.	.6997	87.7	S.S.W.	248	5	32	11 A	†-A	9-15 P	.29	
16	3	55.7	.5569	83.	S.W.	182	7	37	11 A	10 A	1 P	.31	
17	2	45.3	.4452	70.	S.W.	194	7½	39	8 A				
18	0	49.7	.4880	74.7	S.W.	91	1	14	1-30 P				
19	4	58.7	.5602	89.3	S.S.W.	54	0	—	—	9-30 A	2 P	.27	
20	12	46.3	.5511	61.	N.N.W.	167	5	32	2 P				
21	12	40.3	.4321	60.	N.	80	2½	22	1-30 P				
22	1	52.7	.4879	83.	S.S.W.	98	3	24	9-30 A	1-15 P	2-30 P	T.	
23	3	54.7	.5630	77.7	S.W.	53	0	—	—	4-45 P	6 P	.06	
24	9	50.	.4219	84.	N.	104	3½	26	10-30 A				
25	0	51.	.4679	80.7	N.N.W.	57	5	32	10 P	6-45 A	6 P	.18	
26	2	40.7	.4070	64.	N.	95	2	20	7 A				
27	0	42.3	.3524	78.	N.	33	0	—	—				
28	11	41.3	.3805	73.	N.	100	3½	26	7 A				
29	0	42.7	.3446	80.3	N.	106	6	34	7-30 A	6-30 A	7-30 P	.39	
30	11	35.	.3750	58.7	N.N.E.	212	14½	54	11 A				

†Early morning. T=trace.

REMARKS.

September was cool and dry, the mean temperature was two degrees below normal and the rainfall was about an inch below the normal. The first frost of the season occurred on the third, but no severe frosts were recorded during the month. The following is furnished by the New England Weather Service.

The weather conditions during the month of September, 1893, were influenced by seven cyclones and nine anticyclones. Five of the cyclones passed north of us, down the St. Lawrence Valley, one across central New England from west to east and one up the coast east of us.

The storms were not severe, with possibly the exception of the thunder storm of the 7th. A very heavy wind accompanied this storm and considerable damage was done in the eastern part of the state, and in the vicinity of Providence, R. I. At Boston the wind velocity increased in five minutes from 16 to 40 miles per hour, with a maximum velocity of 44 miles.

The temperature during the month was considerably below the normal and the precipitation was also deficient.

The storm of the 29th was accompanied by light snow in the Berkshire Hills. At Pittsfield the snow began at 7.40 A. M. and continued for about half an hour. The flakes were large, and rain fell at the same time. The driver of the Williamstown and Pittsfield stage states that in the vicinity of New Ashford the snow was about three inches deep. Of course it melted in a very short time.

The last part of the month was unsettled, but no general storm occurred.

The crops are about all harvested and are reported in good condition generally.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 58. OCTOBER, 1893.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.36, 19th, 11 A.
Actual minimum reading,	29.00, 14th, 8 A.
Mean reduced to sea level,	30.126
Monthly range,	1.36

****Air Temperature.*** In Degrees Fahr.

Highest,	75, ; 80, 9th
Lowest,	30; 23, 17th
Mean,	53.8 ; 52.6
Monthly Range,	45. ; 57.
Highest mean daily,	64. ; 65.
Lowest mean daily,	37. ; 35.
Mean maximum,	61.5; 65.6
Mean minimum,	46. ; 39.7
Mean daily range,	15.6; 25.8
Greatest daily range,	29. ; 43.
Least daily range,	2. ; 10.

Humidity.

Mean dew point,	44.2
Mean force of vapor,	.4653
Mean relative humidity,	67.

Wind.

Prevailing Directions.

South West,	23 per cent.
South,	14 " "
North,	13 " "
North West,	13 " "
Other directions,	37 " "
Total movement,	4198 m.
Greatest daily movement,	486 m., 14th.
Least daily movement,	21 m.; 17th.
Mean daily movement,	135 m.
Mean hourly velocity,	5.6 m.
Maximum pressure per square foot,	23 lbs.= 68m. per hour, 14th, at 3 A.

****Precipitation.*** In inches.

Total precipitation,	2.70; 4.88

Weather.

Mean cloudiness observed,	40.4 per cent.
Number of clear days,	10
Number of fair days,	7
Number of cloudy days,	14
Total cloudiness recorded by the Sun Thermometer,	160 hours or 46.8 per cent.
Number of days on which .01 inch or more rain fell,	6
Frost,	17th, 18th, 30th, 31st.

Bright Sunshine.

Number of Hours recorded,	182
Rain,	4th, 7th, 14th, 23d, 24th, 27th, 28th.
Mean Ozone,	27.7 per cent.
Aurora Borealis,	2d.

Halos.

Solar,	1st, 13th.
Lunar,	20th, 22d.

Gales, of 35 or more miles per hour, 47, 1st, N ; 45 2d, N.; 49, 9th, W.N.W.; 36, 10th, N.W.; 52, 13th, S.W.; 68, 14th, S.W.; 46, 15th, S.W.; 36, 25th, N.W.; 51, 29th, S W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
DAY.	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.00	29.67	29.66	62.	65.	12 M	45.	36.	5 A	54.8	20
2	30.04	29.77	29.907	69.	74.	4 P	52.	45.	6 A	60.9	20
3	30.15	30.04	30.12	72.	75.5	5 P	45.	36.5	6 A	57.5	40
4	30.115	30.00	30.047	57.	60.	1 A	55.	50.	4 A	55.7	40
5	30.13	30.03	30.07	68.	75.	4 P	53.	53.	12 P	56.3	40
6	30.20	30.08	30.133	69.	74.	2 P	45.	38.	6 A	57.7	10
7	30.08	29.96	30.01	71.	76.	2 P	56.	52.	12 P	63.4	30
8	30.13	30.01	30.06	68.	72.	3 P	46.	37.	6 A	58.3	10
9	30.01	29.68	29.827	75.	80.	2 P	48.	40.	7 A	61.9	30
10	30.25	29.90	30.117	63.	68.	5 P	49.	40.	5 A	54.7	20
11	30.34	30.23	30.273	71.	75.	5 P	42.	34.	6 A	54.5	30
12	30.31	30.19	30.24	70.	76.	4 P	43.	35.	6 A	56.2	30
13	30.22	29.70	30.007	67.	73.	3 P	46.	37.	7 A	58.9	20
14	29.70	29.28	29.397	69.	72.	10 A	57.	53.	12 P	64.9	30
15	30.07	29.56	29.83	56.	59.	1 A	48.	44.	12 P	53.2	50
16	30.43	30.07	30.31	47.	50.	1 A	38.	34.5	12 P	43.9	40
17	30.50	30.37	30.433	59.	66.	4 P	30.	23.	7 A	44.2	0
18	30.59	30.41	30.503	60.	65.5	4 P	40.	31.	6 A	50.	0
19	30.65	30.58	30.61	52.	50.5	2 P	47.	40.5	1 A	49.3	20
20	30.58	30.33	30.427	57.	59.	3 P	48.	40.	2 A	51.7	20
21	30.33	30.18	30.243	66.	70.	4 P	47.	34.	6 A	56.	30
22	30.42	30.29	30.373	68.	75.	3 P	45.	39.	6 A	57.6	20
23	30.39	30.09	30.283	60.	62.	10 P	55.	50.	3 A	57.2	40
24	30.09	29.82	29.86	67.	71.	12 M	59.	59.	5 A	62.6	50
25	30.17	29.84	29.977	60.	62.5	1 A	45.	44.5	12 P	55.	20
26	30.30	30.17	30.257	55.	60.	3 P	40.	34.	5 A	47.9	30
27	30.255	29.89	30.087	59.	62.	5 P	49.	44.5	1 A	53.6	30
28	29.90	29.82	29.85	58.	62.	1 A	48.	42.5	12 P	52.2	50
29	30.28	29.90	30.103	47.	49.5	1 A	39.	36.	12 P	43.9	40
30	30.47	30.28	30.433	42.	46.5	2 P	35.	26.	6 A	38.6	20
31	30.54	30.42	30.473	44.	47.	4 P	30.	23.	6 A	37.	30

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	6	36.	.4363	50.7	N.	299	11	47	12 M				
2	11	47.3	.5293	64.3	N.E.	252	10	45	9 A				
3	11	48.7	.5144	70.3	S.	81	0	—	—				
4	0	52.3	.4597	84.7	N.E.	71	0	—	—	†–A	†–A	T.	
5	4	52.7	.5569	73.7	N.	34	2	20	12 M				
6	2	49.7	.5623	62.3	S.W.	58	2	20	8-30 P				
7	8	53.3	.6376	66.	S.W.	160	4	28	2 P	†–A	10 A	.44	
8	6	47.	.5813	58.	S.W.	53	½	10	9-30 P				
9	10	47.3	.5994	61.3	S.W.	209	12	49	6 P				
10	11	36.	.4127	54.7	N.	245	6½	36	1 P				
11	11	42.3	.4222	61.3	N.W.	67	1	14	1 A				
12	11	46.	.5258	65.3	S.W.	70	0	—	—				
13	6	51.3	.5608	72.	S.	101	13½	52	12 P				
14	2	52.3	.6715	62.7	S.W.	486	23	68	3 A	†–A	4-15 P	.90	
15	3	36.7	.3947	56.	S.W.	296	10½	46	1-30 P				
16	2	37.	.3139	70.	N.W.	133	2	20	1-30 P				
17	11	32.3	.3903	56.7	S.	21	0	—	—				
18	10	41.	.3987	68.3	N.	101	½	10	2 P				
19	0	41.3	.3989	65.3	N.W.	24	0	—	—				
20	2	45.	.4402	69.	S. S. W.	90	3½	26	4-30 P				
21	5	49.	.4982	74.	S.W.	86	1	14	2 P				
22	10	52.	.5555	72.3	S.W.	54	1	14	2 P				
23	0	57.3	.5218	91.	E.S.E.	106	4	28	9 P	†–A	12 P		
24	3	58.	.6218	79.	S.W.	149	2	20	11 A	0 A	7-15 A	1.51	
25	10	42.3	.3984	69.7	N.W.	166	6½	36	10 A				
26	6	36.	.3529	63.3	N.	145	3	24	7 P				
27	0	51.	.4694	78.7	S.	120	2	20	10 P	4-15 P	12 P		
28	5	43.7	.4032	72.3	N.	170	2½	22	10 A	0 A	8-30 A	2.03	
29	3	27.	.2736	54.7	W.N.W	226	13	51	9 A				
30	3	25.7	.2602	54.	N. W.	64	1½	17	12 M				
31	10	32.	.2634	74.	N.	61	1	14	12 M				

†Early morning. T=trace.

REMARKS.

October was remarkable for a large amount of sunshine; the temperature was much above the normal while the rainfall was below the average; the number of rainy days was small, most of the precipitation occurred on the 23 and 24. Gales were numerous; the severest was experienced on the 14th; the wind velocity was much higher than usual for October.

The following was furnished by the New England Weather Service: The weather during the month of October was influenced by seven cyclones and the same number of anticyclones. Of the cyclones, four passed north of New England down the St. Lawrence Valley; one developed over the State of Ohio, moved eastward and united with a storm from the Gulf of Mexico, then passed out to sea with little rain except in southern portions of New England; one formed over the Gulf of Mexico, but dissipated over the Middle Atlantic Coast; and one, the most severe of the month passed across New York State, then down the St. Sawrence, causing high southerly gales and rain in this part of the country.

The temperature was from three to five degrees above normal and the precipitation was also above the average, except in eastern sections where a slight deficiency has been reported.

The most severe storm of the month occurred on the 14th, as a West India Hurricane, similar to those of August last, moved across Pennsylvania and New York. More damage was done in the southern part of the country than in this vicinity, but high gales prevailed during the day and the rainfall was heavy, especially in western New England. At Boston the maximum velocity of the wind was 49 miles. The timely warning given of the storm probably accounts for the small amount of damage done in New England.

The frost held off remarkably. At Westbaro, Mass., the first killing frost occurred on the 17th, but the latter part of the month was cooler and frosts were more common.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 59. NOVEMBER, 1893.

MONTHLY SUMMARY.

Pressure. In Inches.

Actual maximum reading,	30.40, 26th, 10 P.
Actual minimum reading,	29.25, 15th, 2 P.
Mean reduced to sea level,	30.124
Monthly range,	1.15

**Air Temperature.* In Degrees Fahr.

Highest,	58,; 63, 2nd
Lowest,	17; 11, 27th
Mean,	40.2 ; 38.2
Monthly Range,	41. ; 52.
Highest mean daily,	52.1; 49.5
Lowest mean daily,	25.2; 21.
Mean maximum,	45.9; 48.8
Mean minimum,	33.6; 27.6
Mean daily range,	12.3; 21.1
Greatest daily range,	22. ; 37.
Least daily range,	3. ; 11.

Humidity.

Mean dew point,	29.9
Mean force of vapor,	.2644
Mean relative humidity,	68.8

Wind.

Prevailing Directions.

South West,	22 per cent.
North West,	14 " "
North,	13 " "
South,	11 " "
Other directions,	40 " "
Total movement,	4179 m.
Greatest daily movement,	286 m., 28th.
Least daily movement,	7 m.; 8th.
Mean daily movement,	139 m.
Mean hourly velocity,	5.8 m.
Maximum pressure per square foot, 14 lbs.= 53m. per hour, 24th, at 10 P.	

**Precipitation.* In inches.

Total precipitation,	1.96; 2.81

Weather.

Mean cloudiness observed,	49 per cent.
Number of clear days,	8
Number of fair days,	6
Number of cloudy days,	16
Total cloudiness recorded by the Sun Thermometer,	160 hours or 54 per cent.
Number of days on which .01 inch or more rain fell,	8

Bright Sunshine.

Number of Hours recorded,	133
Rain,	3d, 4th, 13th, 15th, 18th, 21st, 22d, 28th.
Snow,	4th, 19th, 20th, 21st, 24th.
Mean Ozone,	21 per cent.
Aurora Borealis,	3d.

Halos.

Solar,	7th, 8th, 9th, 21st, 23d.
Lunar,	23d.

Gales, of 35 or more miles per hour, 37, 9th, N.; 48 16th, W.; 45, 17th, S.W.; 42, 18th, N.W.; 53, 24th, W.N.W.; 35, 25th, N.W.; 45, 28th, S.E.; 35, 29th, S.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE
1	30.45	30.31	30.367	53.	57.	2 P	35.	25.	1 A	44.4	30
2	30.33	30.12	30.217	58.	63.	1 P	41.	35.	5 A	49.9	10
3	30.15	29.99	30.037	56.	58.	12 M	42.	41.	12 P	52.1	0
4	30.22	30.13	30.15	42.	45.	10 A	35.	27.5	5 A	38.	30
5	30.32	30.18	30.297	44.	50.5	3 P	35.	31.	7 A	39.1	10
6	30.45	30.27	30.327	52.	57.	2 P	32.	26.	6 A	41.7	40
7	30.55	30.45	30.517	49.	56.	3 P	34.	25.5	8 A	40.8	0
8	30.52	30.18	30.357	49.	48.5	2 P	32.	26.	5 A	39.8	20
9	30.21	30.02	30.087	52.	57.	3 P	36.	31.	6 A	44.	0
10	30.43	30.21	30.377	43.	47.	4 A	30.	24.	4 A	36.4	40
11	30.48	30.41	30.44	48.	55.	4 P	26.	18.	7 A	38.3	20
12	30.54	30.33	30.46	48.	46.	3 P	34.	28.	7 A	41.1	40
13	30.33	30.04	30.117	51.	53.	1 P	42.	33.	1 A	47.2	20
14	30.06	29.88	29.977	50.	54.	1 A	42.	33.	7 A	47.1	10
15	29.88	29.54	29.63	48.	46.	1 A	33.	29.	11 P	40.3	40
16	30.13	29.66	29.877	35.	37.	2 P	32.	26.	4 A	33.4	60
17	30.19	29.95	30.043	50.	54.	2 P	32.	24.	1 A	41.4	20
18	30.09	29.81	29.937	56.	59.	11 A	37.	34.	11 P	45.4	30
19	30.11	29.96	30.023	41.	47.	2 P	35.	29.	11 P	37.4	20
20	30.19	29.96	30.053	37.	39.5	1 P	30.	26.	12 P	33.8	20
21	30.23	29.98	30.123	40.	39.	2 P	27.	18.	6 A	34.4	10
22	29.98	29.63	29.693	46.	51.	3 P	36.	32.	3 A	41.2	0
23	29.79	29.70	29.76	45.	46.	1 A	38.	31.	7 A	40.4	0
24	29.96	29.70	29.78	37.	40.	1 A	29.	27.	10 P	34.3	10
25	30.45	29.96	30.293	32.	34.	2 P	29.	23.	1 A	30.4	20
26	30.70	30.45	30.643	31.	33.	1 A	22.	18.	12 P	27.6	10
27	30.70	30.20	30.61	33.	31.	12 P	17.	11.	7 A	25.2	20
28	30.20	29.61	29.71	55.	56.	3 P	34.	28.	1 A	48.3	30
29	30.08	29.73	29.947	49.	51.	3 P	44.	38.	5 A	46.5	20
30	29.94	29.69	29.85	49.	52.	1 A	38.	31.	11 P	44.6	40

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	9	32.3	.3242	60.3	S.	152	3½	26	4 P				
2	10	39.3	.4500	55.3	S.W.	222	4	28	3 P				
3	0	42.7	.4075	72.3	S.W.	179	3	24	7 A	9-30 A	10-30 A	.04	
4	0	32.3	.2082	88.	N.N.W.	92	1	14	11 A	10-30 A	11 P	.60	T.
5	8	31.7	.2417	77.	N.	118	2	20	8 A				
6	10	31.3	.2814	67.	S.	72	4	28	1-30 P				
7	10	27.3	.2372	59.7	N.W.	44	0	—	—				
8	1	29.	.2826	64.	N.	7	0	—	—				
9	0	35.7	.2987	73.	N.	175	7	37	6 P				
10	10	23.7	.2139	63.7	S.W.	93	1	14	0 A				
11	10	26.7	.2392	68.3	S.W.	28	0	—	—				
12	1	33.	.2651	83.7	S.	45	0	—	—				
13	0	43.3	.34,2	82.	S.	159	3½	26	11 A	2 P	3 P	.02	
14	5	33.3	.3562	57.	S.W.	77	1	14	2 P	†–A	10 A	.15	
15	1	31.	.2231	79.3	W.	85	3½	26	11-30 P				
16	4	19.3	.1739	64.7	W.	232	11½	48	2 P				
17	5	28.7	.2940	58.	S.W.	196	10	45	1-30 P				
18	2	30.3	.2894	59.3	N.W.	232	9	42	3-30 P	11-30 A		T.	
19	0	27.7	.2321	67,	S.W.	62	½	10	12 M	†–A	†–A	.01	T.
20	3	20.3	.1907	59.3	N.W.	118	3½	26	11 A	†–A	†–A		T.
21	4	25.3	.2017	73.7	S.	106	2½	22	8 P	7-45 P	12 P		T.
22	5	37.7	.2925	78.7	S.W.	141	3	24	8 P	0 A	11 A	.82	
23	3	29.3	.2364	70.	S.W.	136	2	20	12 M				
24	3	24.	.1731	75.3	W.N.W	204	14	53	2 P	2-10 P	2-30 P		T.
25	9	17.7	.1518	67.7	N.W.	251	6	35	1-30 P				
26	9	13.7	.1296	65.7	N.W.	183	5	32	5 A				
27	3	24.	.1483	91.7	W.	8	0	—	—				
28	2	40.7	.3880	74.3	S.W.	286	10	45	6 A	†–A	12-30 P	1.17	
29	0	36.7	.3450	63.3	S. W.	264	6	35	5 P				
30	6	25.	.3115	46.3	W.	212	3½	26	11 A				

†Early morning. T=trace.

REMARKS.

The temperature for November was about normal, the rainfall was below normal, the greatest quantity of rain fell on the 28th. The coldest day occurred on the 27th. The surrounding hills, on several occasions were covered with snow, but only an inappreciable amount was recorded at Amherst. A slight earthquake was felt on the 27th.

The following was furnished by the New England Weather Service :

The weather during the month of November was remarkably pleasant with temperature about normal. The maxima temperatures were recorded generally on the 3rd and the minima occurred in all districts on the morning of the 27th. The precipitation was considerably below the average. At Boston the deficiency amounted to 2.87 inches. Snow fell at a few scattered stations on the 4th and light flurries also occurred on the 15th and 20th. In most cases it melted as it fell. The storms were not severe and no high gales have been reported. At Boston the maximum velocity was 39 miles per hour from the southeast on the 28th. An earthquake, although most severe in northern New England, was very generally felt at about noon on the 27th. The center of the disturbance appears to have been in the Province of Quebec.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 60. DECEMBER, 1893.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.61, 14th, 9 A.
Actual minimum reading,	29.09, 16th, 8 30 P.
Mean reduced to sea level,	30.12
Monthly range,	1.52

**Air Temperature.* In Degrees Fahr.

Highest,	51,; 52, 25th
Lowest,	—2 ; —12, 14th
Mean,	28.2 ; 25 5.
Monthly Range,	53. ; 64.
Highest mean daily,	47.3; 44.5
Lowest mean daily,	5.5; 0.
Mean maximum,	34. ; 35.2
Mean minimum,	21.9; 15.9
Mean daily range,	12. ; 19.3
Greatest daily range,	28. ; 34.
Least daily range,	2. ; 8.

Humidity.

Mean dew point,	21.9
Mean force of vapor,	.1632
Mean relative humidity,	80.9

Wind.

Prevailing Directions.

North West,	22 per cent.
North,	18 " "
South,	18 " "
South South West,	8 " "
Other directions,	34 " "
Total movement,	3916 m.
Greatest daily movement,	351 m., 26th.
Least daily movement,	11 m.; 15th.
Mean daily movement,	126 m.
Mean hourly velocity,	5.2 m.

Maximum pressure per square foot, 18½ lbs.= 61m. per hour, 26th, at 5-30 A.

**Precipitation.* In inches.

Total precipitation,	3.85; 4.86

Weather.

Mean cloudiness observed,	54 per cent.
Number of clear days,	7
Number of fair days,	6
Number of cloudy days,	18
Total cloudiness recorded by the Sun Thermometer,	171 hours or 60 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	16
Number of inches of snow on the ground at the close of the month,	3

Bright Sunshine.

Number of Hours recorded,	112

Rain, 1st, 3d, 4th, 15th, 16th, 17th, 23d, 24th, 29th.

Snow. 3d, 5th, 9th, 12th, 14th, 15th, 19th, 28th, 30th, 31st.

Total fall in inches,	14¾
Hail,	3rd, 15th.
Mean Ozone,	26 per cent.
Thunder and Lightning,	3d.

Halos.

Solar,	9th, 14th.
Lunar,	21st.

Gales, of 35 or more miles per hour, 37, 2nd, W.N.W.; 53 11th, W.N.W.; 41, 12th, N.W.; 36, 13th, N.W.; 35, 17th, W.N.W.; 47, 20th, N.W.; 61, 26th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.99	29.76	29.877	38.	40.	1 A	31.	29.	12 P	36.8	0
2	30.41	29.99	30.313	30.	32.	1 A	25.	18.	10 A	27.6	10
3	30.40	29.66	29.933	32.	32.	10 P	25.	19.	1 A	27.4	40
4	30.47	29.67	30.177	32.	34.	1 A	15.	13.	12 P	25.7	0
5	30.53	30.05	30.323	18.	25.5	12 P	14.	8.	2 A	14.8	20
6	30.35	30.05	30.263	30.	33.	4 P	15.	7.	7 A	22.	50
7	30.41	30.27	30.333	30.	32.	2 P	21.	13.	4 A	26.1	30
8	30.53	30.41	30.453	28.	28.	4 P	18.	7.5	7 A	23.4	10
9	30.41	29.89	30.147	29.	29.	8 P	17.	8.	6 A	24.3	20
10	29.89	29.74	29.797	40.	42.	11 A	30.	24.	1 A	37.2	30
11	30.34	29.84	30.237	36.	35.5	1 A	20.	11.	12 P	24.5	50
12	30.33	29.93	30.093	31.	33.	3 P	13.	12.	12 P	20.3	20
13	30.76	30.33	30.613	19.	19.5	12 M	5.	—5.	7 A	9.4	40
14	30.92	30.54	30.77	13.	12.	5 P	—2.	—12.	4 A	5.5	10
15	30.54	30.07	30.21	30.	26.	10 P	10.	4.	7 A	20.	30
16	30.07	29.39	29.617	35.	34.	12 P	28.	24.5	5 A	30.4	20
17	29.87	29.44	29.697	36.	37.	11 A	24.	22.	12 P	33.2	40
18	30.06	29.87	29.963	27.	30.	4 P	15.	7.	8 A	22.5	20
19	29.94	29.64	29.74	37.	38.	3 P	28.	20.	1 A	33.6	20
20	30.51	29.87	30.32	31.	30.	1 A	19.	10.	9 P	23.8	40
21	30.46	30.11	30.22	40.	42.	3 P	19.	11.	1 A	30.5	30
22	30.44	30.19	30.367	41.	41.	1 P	35.	25.5	9 P	37.8	10
23	30.41	30.10	30.183	46.	48.	3 P	35.	32.	1 A	41.6	10
24	30.33	30.14	30.223	50.	48.	1 P	38.	29.	8 A	45.	20
25	30.14	29.72	29.897	51.	52.	2 P	43.	37.	6 A	47.3	10
26	30.41	29.69	30.193	48.	50.	1 A	20.	16.	11 P	28.6	60
27	30.38	29.98	30.11	30.	31.5	3 P	15.	11.	8 A	23.6	30
28	29.98	29.57	29.71	39.	39.	8 P	30.	24.	1 A	34.6	40
29	29.91	29.51	29.633	41.	43.	1 P	39.	35.	1 A	40.2	40
30	30.21	29.91	30.147	41.	40.	1 A	23.	20.	10 P	30.	20
31	30.29	30.10	30.16	32.	34.	2 P	20.	12.	12 P	25.5	30

*First column denotes reading at top of tower, the second at base.

ANNUAL SUMMARY FOR 1893.

PRESSURE.

In Inches.

Actual max. reading,	30.61, Dec. 14th, 9 A.M.
Actual min. reading,	28.69, Feb. 20th, 1 A.M.
Mean reduced to sea level,	30.047
Annual range,	1.92

**AIR TEMPERATURE.*

In Degrees Fahr.

Highest,	96, June 20th; 96, Aug. 10th
Lowest,	—3; —13, Jan. 17th
Mean,	47.7; 45.4
Annual range,	99.; 109.
Highest mean daily,	83.8; 78.5, June 20th
Lowest mean daily,	4.7, Jan. 17th; 0, Dec. 14th
Mean Maximum,	55.7; 57.2
Mean Minimum,	39.9; 33.5
Mean daily range,	12.7; 23.7
Greatest daily range,	38, Feb. 6th; 45 May 11th
Least daily range,	1, Feb. 13th; 7, March 11th

HUMIDITY.

Mean dew point,	37.9
Mean force of vapor	.4145
Mean relative humidity,	71.1

WIND.

Prevailing Directions.

North,	16%
South West,	15%
North West,	14%
South,	11%
Total movement	52411 m.
Greatest daily movement,	486 m., Oct. 14th
Least daily movement,	5 m., Jan, 23d
Mean daily movement,	143.6 m.
Mean hourly velocity,	6 m.

Max. pressure per sq. ft., 37½ lbs.=86½ m. per hour, Aug. 29th, at 3 P. M.

PRECIPITATION.

Total rain-fall or melted snow,	46.94 in.
Number of days on which .01 inch of rain or melted snow fell,	143
Total snow fall in inches,	74¼ in.

WEATHER.

Mean cloudiness observed,	50%
Total cloudiness recorded by the Sun Thermometer,	2434 hrs. or 54 %
Number of clear days,	101
Number of fair days,	96
Number of cloudy days,	168

BRIGHT SUNSHINE.

Number of hours recorded,	2072
Mean Ozone,	31%

DATES OF FROSTS.

Last,	May 8th
First,	Sept 3d

DATES OF SNOW.

Last,	April 21st
First,	Nov. 4th

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*The first figures denote reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	0	29.3	.1856	88.3	N.W.	102	2	20	10-30 P	9 A	4-30 P	.39	¼
2	5	20.3	.1287	87.3	N.W.	191	7	37	4 A				
3	0	28.3	.1908	83.7	N.	74	3	24	12 M	†–A	12 P		6
4	6	18.7	.1231	85.3	N.W.	35	1	14	8 A	0 A	†–A	2.26	
5	0	12.	.0864	91.7	N.	194	1	14	7 P	11-30 A	11 P	.16	2½
6	9	18.3	.1316	79.3	S.	67	½	10	1 A				
7	5	22.3	.1536	79.	N.W.	26	0	—	—				
8	4	20.3	.1345	84.	S.E.	20	0	—	—				
9	2	21.7	.1456	83.3	S.W.	19	0	—	—	2 P	6 P	.17	1
10	1	33.7	.2331	83.3	S.	149	4	28	10 P				
11	9	10.7	.1051	70.7	W.N.W	242	14	53	8 A				
12	1	16.7	.1086	89.3	N.W.	91	8½	41	4 P	†–A	2-30 P	.05	½
13	9	5.7	.0737	83.7	N.W.	162	6½	36	1 P				
14	2	2.3	.0556	94.7	S.W.	31	0	—	—	4-30 P	12 P		
15	0	17.3	.1444	90.	N.W.	11	0	—	—	0 A	12 P		2
16	0	26.7	.1989	89.	N.W.	28	2	20	4 P	0 A	12 P		
17	2	22.7	.1706	73.7	W.N.W	171	6	35	12 M	0 A	†–A	1.39	
18	9	19.	.1262	85.	S.	94	1	14	3 P				
19	1	29.	.2014	78.3	S.S.W.	168	4½	30	7 P	†–A	11-30 A	.04	
20	9	14.3	.0967	88.3	N.W.	225	11	47	6 A				
21	6	18.	.1829	58.7	S.	192	2	20	2 P				
22	0	28.7	.2063	76.	N.W.	92	5	32	3 A				
23	0	38.	.2856	81.	S.	167	2	20	9 A	†–A	1 P	.15	
24	2	33.	.2726	70.	S.	110	1	14	2 P	2 P		T.	
25	8	40.	.3246	77.	S.S.E.	149	2	20	8 P				
26	9	15.7	.1243	74.3	.N	351	18½	61	5-30 A				
27	7	20.	.1479	77.7	S.W.	76	1	14	11 P				
28	2	27.	.2045	72.3	S.	246	4	28	2 P	11 A	3 P	.01	T.
29	1	32.	.2436	75.	W.	159	3	24	8-30 P	10 A	2-30 P	.10	
30	0	18.	.1413	72.7	N.	161	3½	26	9-30 P	3-30 P	12 P		
31	3	20.7	.1316	86.	N.	113	1	14	1 P	0 A	1 P	.14	2

†Early morning. T=trace.

REMARKS.

The mean temperature was 2 degrees above normal. The precipitation was also above normal. The first part of the month was cold and the temperature was below the average, but during the last part the temperature was much above the normal. Many of the farmers have already put in their stock of ice. The latter is of good quality and from 8 to 12 inches thick.

The following is furnished by the New England weather service:

The weather for the month of December was influenced by the passage of eleven cyclones or storm areas and nine anticyclones. Most of the former were fairly well defined; the latter were generally accompanied by sharp cold waves.

The mean temperature averaged over 2 degrees a day below the normal at Boston. The 13th and 14th were 25 degrees below the normal while the 24th and 25th were from 18 to 22 degrees above. The precipitation at Boston was 1.70 inches above the average; 18 inches of snow fell during the month at Boston; 6.7 inches lay on the ground on the 15th and 3.2 inches at the end of the month. At Taunton the total snow fall was 16 inches and 3 inches lay on the ground at the end of the month. At Adams about 6 inches was measured at the end of the month. A severe ice storm prevailed in eastern sections on the 14th to 16th. Christmas day was exceptionally warm; buttercups and pansies were picked out of doors at Taunton.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 61. JANUARY, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.47, 17th, 10 P.
Actual minimum reading,	28.59, 30th, 6 A.
Mean reduced to sea level,	30.175
Monthly range,	1.88

**Air Temperature.* In Degrees Fahr.

Highest,	50, 24th ; 53, 25th
Lowest,	7, 13th ; 1, 29th
Mean,	28.7 ; 26.
Monthly Range,	43. ; 52.
Highest mean daily,	39.6 ; 39 7
Lowest mean daily,	15.7 ; 14.
Mean maximum,	34.5 ; 36.2
Mean minimum,	22.6 ; 16.7
Mean daily range,	11.9 ; 19.5
Greatest daily range,	24. ; 34.
Least daily range,	3. ; 7.

Humidity.

Mean dew point,	21.6
Mean force of vapor,	.1599
Mean relative humidity,	78.8

Wind.

Prevailing Directions.

North West,	22 per cent.
North,	22 " "
South,	17 " "
South West.	8 " "
Other directions,	31 " "
Total movement,	4193 m.
Greatest daily movement,	441 m., 12th.
Least daily movement,	11 m.; 14th.
Mean daily movement,	135 m.
Mean hourly velocity,	5.6 m.

Maximum pressure per square foot, 20 lbs.= 63m. per hour, 12th, at 2 P.

**Precipitation.* In inches.

Total precipitation,	2.16

Weather.

Mean cloudiness observed,	52.8 per cent.
Number of clear days,	7
Number of fair days,	7
Number of cloudy days,	17
Total cloudiness recorded by the Sun Thermometer,	174 hours or 59 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	16
Number of inches of snow on the ground at the close of the month,	13

Bright Sunshine.

Number of Hours recorded,	120

Rain, 3d,5th,15th,16th,19th,21st.22d,24th,25th.

Snow. 6th,7th, 10th, 11th, 14th, 18th, 26th,27th, 29th, 30th, 31st.

Total fall in inches,	19½
Hail,	3rd, 15th.
Mean Ozone,	30 per cent.
Aurora Borealis,	3d.

Halos.

Solar,	9th, 15th, 26th.
Lunar,	13th.

Gales, of 35 or more miles per hour, 39, 8th. W.N.W.; 63 12th, N.W.; 47, 13th, N.W.; 42, 16th, N.; 37, 18th, S.W.; 40, 19th, N.; 42, 24th, S.W.; 42, 25th, N.W.; 35, 29th, N.; 52, 30th, N.W.; 49, 31st, W.N.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.44	30.29	30.38	29.	35.	1 P	16.	7.5	3 A	22.	20
2	30.41	30.13	30.24	36.	38.	4 P	12.	4.	5 A	24.9	50
3	30.13	29.91	29.98	37.	38.	4 P	19.	11.5	9 A	30.1	30
4	29.93	29.77	29.84	42.	41.5	2 P	32.	26.	5 A	38.2	30
5	29.96	29.74	29.85	40.	40.	1 A	37.	23.	12 P	39.6	50
6	30.19	29.96	30.093	39.	39.	2 P	32.	27.	8 A	36.2	40
7	30.09	29.94	29.993	39.	38.	2 M	31.	26.	8 P	35.3	20
8	30.43	30.09	30.34	30.	30.	1 A	24.	17.5	9 P	26.	50
9	30.48	30.32	30.407	28.	29.5	3 P	22.	15.	5 A	24.3	30
10	30.32	30.18	30.217	22.	21.	1 A	19.	14.	5 A	20.4	40
11	30.18	29.54	29.827	31.	29.5	11 P	21.	18.	1 A	25.1	20
12	29.94	29.54	29.737	32.	34.	1 A	12.	8.	12 P	23.8	20
13	30.12	29.94	30.077	22.	26.5	3 P	7.	1.5	7 A	15.7	10
14	30.23	30.06	30.143	82.	28.	3 P	19.	13.	7 A	23.7	0
15	30.24	29.97	30.13	39.	38.	9 P	18.	11.	6 A	29.3	10
16	30.33	29.88	29.95	42.	44.5	2 P	35.	30.	12 P	38.9	30
17	30.77	30.33	30.673	34.	38.	2 A	22.	22.	12 P	28.5	50
18	30.77	30.34	30.577	36.	35.5	8 P	21.	16.	1 A	28.8	30
19	30.71	30.30	30.50	39.	41.5	11 A	27.	27.	11 P	35.7	30
20	30.76	30.57	30.663	33.	39.	3 P	18.	14.	8 A	26.4	20
21	30.57	30.12	30.373	34.	32.	1 P	22.	17.	6 A	29.2	20
22	30.27	30.06	30.121	44.	46.5	2 P	33.	28.5	1 A	36.9	10
23	30.53	30.27	30.457	38.	37.5	2 P	30.	23.	6 A	33.2	20
24	30.52	29.74	30.123	50.	51.5	11 P	33.	28.	1 A	37.4	20
25	30.63	29.82	30.383	36.	53.	1 A	19.	16.	12 P	28.4	30
26	30.73	30.40	30.60	26.	27.	4 P	12.	8.	8 A	19.3	40
27	30.40	30.05	30.14	31.	32.5	4 P	22.	15.	5 A	25.7	20
28	30.51	30.23	30.417	31.	33.	3 P	17.	10.	8 A	23.3	30
29	30.50	29.35	30.117	33.	33.5	10 P	9.	1.	7 A	20.5	40
30	29.64	28.88	29.187	32.	35.	1 A	29.	16.	2 P	30.7	40
31	30.10	29.64	29.9 3	35.	35.	5 P	30.	22.	8 P	32.	40

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
												TOTAL IN INCHES.	
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	SNOW.
1	9	14.	.1094	82.3	S.W.	64	1	14	8 A				
2	9	19.3	.1493	80.3	S.	126	2½	22	2 P				
3	1	23.7	.1759	75.7	S.	100	2½	22	2 P	3-15 P		T.	
4	0	33.3	.2469	79.	S.S.W.	152	1½	17	11 A				
5	0	35.3	.2468	83.7	S.E.	51	0	—	—	10 A	1-30 P	0.6	
6	1	28.	.1977	80.3	N.W.	30	0	—	—	5 P	12 P		
7	6	26.	.1859	78.	S.	70	3	24	1-30 P	0 A	†–A	.08	1½
8	5	11.3	.1302	60.	W.N.W	170	7½	39	2 P				
9	3	18.	.1333	78.3	N.W.	99	2	20	1-30 A				
10	0	14.	.1039	83.	N.W.	48	0	—	—	11-15 A	12 P		
11	0	22.3	.1467	84.7	S.W.	43	1	41	11 P	0 A	11 P	.15	3½
12	6	2.3	.0995	54.	N.W.	441	20	63	2 P				
13	9	4.7	.0878	68.3	N.W.	181	11	47	2 A				
14	0	20.	.1183	80.	N.W.	11	0	—	—	†–A	†–A		T.
15	3	24.7	.1934	76.	S.	46	0	—	—	8-30 P	12 P		
16	5	31.7	.2239	80.3	N.	152	9	42	1-30 P	0 A	9 A	.24	
17	9	20.	.1389	80.	N.E.	231	2	20	1-30 A				
18	0	26.7	.1782	83.7	S.W.	156	7	37	9 P	8-30 P	2 P		T.
19	9	25.7	.2088	71.	N.	282	8	40	1 P	†–A	†–A	.16	
20	9	16.	.1332	73.3	N.	147	½	10	7 A				
21	0	25.7	.1567	88.7	S.W.	14	0	—	—	7-30 P	12 P		
22	6	25.3	.2181	66.7	N.	89	4	28	1-30 P	0 A	†–A	.02	
23	2	24.	.1723	69.7	S.W.	28	0	—	—				
24	0	35.	.2644	82.	N.W.	54	9	42	11 P	12-45 P	12 P		
25	5	19.	.1282	83.	N.W.	279	9	42	6 A	0 A	†–A	.47	
26	2	15.	.1065	87.	.N	125	2	20	8 A	7 P	12 P		
27	2	22.7	.1318	90.3	N.	226	3	24	5 A	0 A	1 P	.39	4½
28	9	17.7	.1216	84.7	S.E.	41	0	—	—				
29	3	18.	.1204	91.3	N.	85	6	35	12 P	12-15 P	12 P		
30	0	26.3	.1599	91.	N.W.	364	13½	52	4-30 P	0 A	2-30 P	.59	10
31	7	23.3	.1651	77.7	W.N.W	285	12	49	1-30 P	8-30 A			T.

†Early morning. T=trace.

REMARKS.

The month was unusually warm, the mean temperature being 5.4° above the normal. The precipitation was much below normal; several cold waves and storms occurred during the month. The most severe storm came on the 29th and 30th, when ten inches of snow fell; the wind blew at the rate of 52 miles per hour; the pressure went down to 28.88° in a few hours, a fall of nearly an inch. The following is a summary of the weather in Massachusetts furnished by the New England Weather Service;

The weather for the month of January for Massachusetts was generally warmer and drier than the normal. At the Boston Weather Bureau the daily mean temperature was nearly 5° higher than the normal for 21 years. At Somerset, according to the records given by Mr. Elisha Slade, it was 4.8° above the normal. At Boston the only days cooler than the normal were the 1st, 9th, to 14th, and the 17th, while the others were warmer than might be expected; the 24th showed 23° too warm. The nights were generally cold and there were at least two quite sharp cold waves on the 12th, 13th and 29th. At Somerset the precipitation was 1.70 inches below the average and at Boston it was 1.20 inches below. The snowfall, until the last few days of the month, was especially light. and in all the eastern part of the state very little lay on the ground from the 1st to the 26th. A heavy fall came on that day and again on the 29th and 30th which covers the ground at the end of the month to good depth. It is not thought that the weather changes during the month were great enough to injure fruit in any way, but grass and grain roots in most exposed places must have met with considerable damage. The last storm for the month was one of the most severe on record along the coast; the pressure at Boston went down to 28.78 inches, a fall of 1 inch in 12 hours, and the wind blew at the rate of 51 miles an hour from the northeast.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude. 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 62. FEBRUARY, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.57, 24th, 10 P.
Actual minimum reading,	28.94, 1 th, 3 P.
Mean reduced to sea level,	30.16
Monthly range,	1.63

**Air Temperature.* In Degrees Fahr.

Highest,	50, 18th ; 49, 19th
Lowest,	—9; —11, 25th
Mean,	25.5; 21.6.
Monthly Range,	59. ; 66.
Highest mean daily,	42.; 38.2
Lowest mean daily,	1.; —1.5
Mean maximum,	32.3; 33.5
Mean minimum,	17.8; 9.6
Mean daily range,	14.5; 23.9
Greatest daily range,	32. ; 47.5
Least daily range,	4. ; 10.

Humidity.

Mean dew point,	17.9
Mean force of vapor,	.1491
Mean relative humidity,	77.5

Wind.

Prevailing Directions.

North West,	20 per cent.
North,	15 " "
South,	11 " "
South West,	15 " "
Other directions,	39 " "
Total movement,	4865 m.
Greatest daily movement,	350 m., 11th.
Least daily movement,	33 m.; 14th.
Mean daily movement,	173 m.
Mean hourly velocity,	7.2 m.

Maximum pressure per square foot, 22½ lbs. = 67m. per hour, 23rd, at 2 P.

**Precipitation.* In inches.

Total precipitation,	1.74

Weather.

Mean cloudiness observed,	53 per cent.
Number of clear days,	5
Number of fair days,	7
Number of cloudy days,	16
Total cloudiness recorded by the Sun Thermometer,	175 hours or 59 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	9
Number of inches of snow on the ground at the close of the month,	5

Bright Sunshine.

Number of Hours recorded,	121
Rain,	9th, 10th, 18th, 19th.
Snow.	1st, 4th, 9th, 10th, 11th, 12th, 13th, 15th, 21st, 23rd, 26th.
Total fall in inches,	18¾
Hail,	10th.
Mean Ozone,	36 per cent.
Aurora Borealis,	22d, 23d.

Halos.

Solar,	5th, 12th, 17th, 25th.
Lunar,	14th, 17th, 18th, 20th.

Gales, of 35 or more miles per hour, 35, 4th, N.; 63 11th, W.; 35, 12th, N.; 37, 13th, N.N.E.; 37, 15th, N.; 49, 16th, N.W.; 67, 23d, N.W.; 35, 26th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.09	29.88	29.973	32.	36.	2 P	22.	16.5	12 P	27.7	50
2	30.30	30.08	30.22	29.	32.	5 P	18.	7.	5 A	23.7	30
3	30.10	29.74	29.803	40.	41.	1 P	26.	18.	1 A	35.3	30
4	29.96	29.77	29.823	39.	38.	1 A	16.	10.	12 P	30.6	40
5	30.46	29.96	30.337	21.	24.	5 P	10.	3.5	12 P	14.4	40
6	30.47	30.31	30.393	25.	27.	4 P	0.	-10.5	8 A	13.8	50
7	30.31	29.99	30.11	42.	39.5	3 P	23.	4.	8 A	33.2	50
8	30.10	29.90	29.97	45.	48.5	2 P	35.	28.	4 A	40.2	30
9	30.14	30.02	30.07	37.	38.5	1 A	33.	27.	7 A	34.7	20
10	30.04	29.78	29.87	42.	43.	2 P	34.	33.	1 A	37.4	30
11	30.30	29.87	30.07	39.	39.	1 A	24.	20.	12 P	34.	30
12	30.40	29.93	30.227	23.	28.	1 A	15.	10.	7 A	17.8	40
13	30.42	29.87	30.127	20.	22.	1 A	13.	11.	7 A	15.6	30
14	30.49	30.20	30.39	25.	29.	5 P	6.	—5.	8 A	16.5	50
15	30.20	29.24	29.47	28.	29.	3 P	20.	5.	12 P	23.7	30
16	30.42	29.46	29.993	22.	22.	1 A	9.	—1.	12 P	17.1	40
17	30.58	30.20	30.433	35.	36.	12 P	3.	-11.5	8 A	18.1	50
18	30.21	29.89	30.073	50.	45.	3 P	34.	10.	12 P	42.	20
19	30.25	29.86	30.073	46.	49.	3 P	24.	17.	8 A	36.1	30
20	30.26	29.87	30.173	37.	38.	1 A	31.	23.	7 P	33.5	30
21	30.23	30.08	30.127	33.	34.	1 P	26.	19.5	6 A	29.	20
22	30.26	30.05	30.177	33.	36.	4 P	19.	16.	8 P	26.2	40
23	30.47	30.03	30.23	28.	36.	1 A	8.	5.	12 P	20.4	30
24	30.89	30.47	30.743	6.	8.	1 A	—3.	-11.	8 A	1.	50
25	30.89	30.47	30.727	18.	15.	4 P	—9.	-17.	6 A	6.1	50
26	30.47	30.05	30.16	25.	27.	4 P	15.	9.	1 A	21.2	40
27	30.50	30.21	30.457	38.	36.	5 P	19.	11.	7 A	29.	40
28	30.50	30.28	30.37	46.	42.	5 P	27.	22.	6 A	36.4	20

*First column denotes reading at top of tower. the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	2	19.	.1790	67.7	W.N.W	62	5	32	9 P	7 A	10 A	.02	¼
2	10	17.7	.1189	85.7	S.	137	2	20	9 P				
3	1	25.	.2046	67.7	W.	221	3½	26	5 A				
4	0	22.7	.1562	81.	N.	174	6	35	12 M	2 P	11 P	.04	½
5	9	7.	.0825	77.	N.N.W.	222	5½	33	4-30 A				
6	10	7.7	.0932	75.7	S.W.	129	1	14	0 A				
7	3	22.	.1939	66.3	S.	86	2½	22	2 P				
8	6	29.7	.2654	62.3	N.W.	79	2½	22	2 P				
9	0	31.	.1974	88.7	N.E.	62	1	14	4 P	9-45 A	12 P		
10	0	33.3	.2317	83.	N.W.	107	4	28	11 P	0 A	8 P	.61	3
11	1	20.3	.1650	69.	W.	350	20	63	10 A	7-30 A	8-30 A		T.
12	4	11.7	.1039	76.	N.	209	6	35	4 A	4 P	12 P		
13	2	11.7	.0993	85.7	N.N.E.	309	7	37	11 A	0 A	4 P	.37	6
14	7	13.7	.1111	80.	N.	33	0	—	—				
15	0	19.3	.1216	89.	N.	220	7	37	8 A	†–A	5 P	.57	9
16	6	7.7	.0839	77.	N.W.	312	12	49	11 A				
17	6	18.7	.1391	87.7	S.W.	137	5	32	2 P				
18	3	38.3	.2821	82.3	S.W.	252	5	32	2 A	†–A	11 A	.08	
19	2	26.7	.2280	72.3	S.W.	35	0	—	—	5-45 P	8 P	.05	
20	3	19.7	.1599	72.7	W.N.W	160	5	32	12 M	6-45 A	7-15 A		T.
21	1	19.	.1457	74.7	N.W.	127	5	32	1 P				
22	10	20.7	.1431	80.7	S.S.W.	96	1½	17	4-30 P				
23	6	5.7	.0908	67.3	N.W.	297	22½	67	2 P	7-15 P			T.
24	11	–9.3	.0388	76.3	N.W.	189	3½	26	1-30 P				
25	5	3.3	.0676	84.	S.	56	1½	17	2 P				
26	0	16.3	.1101	85.	N.	216	6	35	5 P	1 P	1-30 P		T.
27	8	22.7	.1522	82.7	S.S.E.	154	5	32	1 P				
28	5	26.7	.2123	72.3	S.S.W.	143	3	24	12 M				

†Early morning. T=trace.

REMARKS.

The weather for the month of February in Massachusetts was colder than the average for other years, and it was drier in the central and western part and wetter on the southeastern coast. At Woods Holl the precipitation for the month was about three-fourths inch above the average amount for this month, but at Boston, Fitchburg and Somerset it was from half an inch to one and one-half inches less. At Springfield, the fall just equalled the normal.

Cold spells prevailed on the 6th, 17th, 24th and 25th. The lowest minimum temperature occurred at most places on the morning of the 25th and was the lowest recorded for a long time at a good many stations; but the coldest day by far was the 24th. The mean temperature for the day must have been below zero in all sections of the state, while a great many observers report the highest for the day, several degrees below zero. At Boston, the temperature was at zero at noon, but ran up to 6° above before night; the mean for the day here was a fraction of a degree below zero. The strong wind made the cold all the more intense. The ground was well covered by snow most of the month and it is not anticipated that any material damage has been done to crops or fruit trees.

A fine auroral display was observed on the 23rd which by many is connected with the cold weather following. Thunder and lightning was observed in the eastern part of the state from 10 to 11 A. M. of the 10th.

The mean temperature for the month was slightly above and the precipitation very much below normal, but the snowfall was greatly above the average for February. The coldest days were the 6th, 14th, 16th, 17th, 24th and 25th—on the last date the mercury registering 17° degrees below zero. The largest fall of snow occurred on the 14th.

February 23d a remarkable display of the Aurora Borealis was observed. A band of greenish-white light extended rainbow-like across the northern portion of the heavens from east to west, about 15° above the horizon; this soon changed into a broad band of red light and from all parts of the heavens flashes and waves of variously colored light shot brilliant rays upward, forming about the zenith a quivering canopy of flame, the most brilliant display lasting about one minute. As this aurora comprehended most of the peculiarities of other varieties, it might be called a complete aurora. Blue birds appeared at the end of the month.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 63. MARCH, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.27, 28th, 9 A.
Actual minimum reading,	29.24, 14th, 5 A.
Mean reduced to sea level,	30.088
Monthly range,	1.03

***Air Temperature.** In Degrees Fahr.

Highest,	69.; 73.; 19th
Lowest,	23.; 17, 27th
Mean,	41.6; 39.6.
Monthly Range,	46. ; 56.
Highest mean daily,	57.1; 52.5
Lowest mean daily,	25.5; 24.
Mean maximum,	49.1; 50.7
Mean minimum,	34.3; 28.6
Mean daily range,	14.7; 22.1
Greatest daily range,	23. ; 41.
Least daily range,	6. ; 10.

Humidity.

Mean dew point,	31.1
Mean force of vapor,	.2804
Mean relative humidity,	67.5

Wind.

Prevailing Directions.

South West,	16 per cent.
North West,	15 " "
West,	13 " "
North,	13 " "
Other directions,	43 " "
Total movement,	4406 m.
Greatest daily movement,	270 m., 19th.
Least daily movement,	17 m.; 8th.
Mean daily movement,	142 m.
Mean hourly velocity,	5.9 m.

Maximum pressure per square foot, 11½ lbs.= 48m. per hour, 30th, at 1 P.

***Precipitation.** In inches.

Total precipitation,	1.07; 1.77

Weather.

Mean cloudiness observed,	55 per cent.
Number of clear days,	5
Number of fair days,	9
Number of cloudy days,	17
Total cloudiness recorded by the Sun Thermometer,	221 hours or 59 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	9
Number of inches of snow on the ground at the close of the month,	0

Bright Sunshine.

Number of Hours recorded,	150

Rain, . . 7th, 8th, 9th, 11th, 13th, 14th, 19th, 21St, 22nd, 23rd, 25th, 29th.

Snow, . . . 15th, 25th, 29th.

Total fall in inches, . . . 2

Mean Ozone, . . . 29 per cent.

Aurora Borealis, . . . 2nd, 30th.

Halos.

Solar,	12th, 13th, 15th, 20th, 22nd.
Lunar,	12th, 20th.

Gales, of 35 or more miles per hour, 37, 3rd. N.N.W.; 35 13th, S.E.; 40, 14th, W.; 37, 16th W.; 44, 22nd, N.; 44, 23d, N.W.; 45, 27th, N.W.; 35, 28th, W.; 48, 30th, 36, 31st, S. W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.28	30.11	30.183	48.	51.	4 P	30.	24.	7 A	40.2	30
2	30.11	29.90	29.973	50.	53.	4 P	33.	23.	7 A	41.5	20
3	30.43	30.02	30.263	48.	48.5	5 P	36.	35.	12 P	41.5	30
4	30.56	30.43	30.503	51.	53.	5 P	28.	22.	7 A	39.6	20
5	30.49	30.34	30.40	55.	57.5	3 P	35.	28.	5 A	45.6	30
6	30.35	30.10	30.22	60.	63.5	3 P	40.	33.	8 A	50.4	40
7	30.14	29.97	30.073	50.	56.5	5 P	37.	33.5	12 P	47.1	20
8	30.15	30.07	30.137	47.	47.	3 P	29.	25.	6 A	38.9	40
9	30.25	30.15	30.213	49.	50.	3 P	33.	29.	8 A	41.5	30
10	30.32	30.26	30.277	55.	57.	4 P	37.	32.	6 A	45.6	10
11	30.27	29.89	30.017	52.	53.	4 P	43.	36.	1 A	46.2	10
12	30.02	29.94	29.977	49.	52.	5 P	38.	31.	6 A	42.7	20
13	29.99	29.62	29.853	51.	54.	3 P	28.	24.	6 A	42.	40
14	30.02	29.53	29.707	44.	42.	1 A	35.	30.	12 P	39.	30
15	30.21	29.97	30.123	40.	39.5	2 P	28.	24.	6 A	33.7	40
16	30.02	29.82	29.863	46.	48.	1 P	33.	29.	1 A	40.4	20
17	30.32	30.02	30.243	53.	56.	5 P	36.	29.	7 A	45.	20
18	30.32	30.03	30.167	62.	65.	4 P	40.	32.	7 A	51.1	30
19	30.06	29.69	29.85	69.	73.	2 P	46.	32.	12 P	57.1	10
20	30.41	30.06	30.31	55.	57.	4 P	37.	30.	6 A	45.	20
21	30.42	29.85	30.167	46.	49.	1 A	40.	34.	9 P	42.8	30
22	30.16	29.79	30.01	52.	55.	8 A	40.	35.	1 A	45.	30
23	30.05	29.65	29.29	47.	49.	5 P	37.	33.	8 A	39.9	20
24	30.23	30.10	30.15	50.	49.	4 P	32.	27.	8 A	40.2	40
25	30.10	29.86	29.923	48.	47.	12 M	36.	31.	9 P	40.3	20
26	30.16	29.87	29.98	36.	36.	1 A	25.	22.	10 P	30.4	50
27	30.43	30.16	30.316	30.	31.	4 P	23.	17.	3 A	25.5	50
28	30.57	30.42	30.483	38.	37.5	3 P	24.	19.	2 A	30.8	40
29	30.42	29.89	30.07	41.	40.	1 P	34.	30.	1 A	37.1	30
30	30.14	29.91	30.03	44.	45.	5 P	35.	28.	2 A	38.8	40
31	30.10	29.73	29.963	55.	57.	2 P	36.	30.	3 A	46.2	30

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	10	29.7	.2437	71.	S.W.	34	0	—	—				
2	3	32.7	.2427	71.3	N.W.	59	2½	22	5 P				
3	11	27.7	.2461	64.	N.N.W.	206	7	37	10 A				
4	11	32.	.2725	70.	S.W.	43	1	14	10 P				
5	9	34.7	.3823	55.3	S.	129	2	20	10 P				
6	10	41.3	.3890	68.3	S.	171	4	28	4-30 P				
7	11	33.	.2975	66.3	N.	222	4½	30	12 M	†-A	†-A	T.	
8	3	29.	.2425	66.7	S.S.W.	17	0	—	—	4 P		T.	
9	4	32.7	.2778	71.	N.	65	1	14	9 P	5-45 P	11 P	T.	
10	8	35.	.3034	71.	S.	57	0	—	—	7 A	5 P	.07	
11	0	41.	.3521	73.3	S.W.	88	3	24	4 P				
12	7	30.7	.2761	62.	N.W.	105	1½	17	3 P				
13	7	27.7	.2875	58.7	S.	156	6	35	10 P	7-45 P	9-15 P	.04	
14	2	23.7	.2091	61.	N.W.	104	8	40	2 P	†-A	†-A	.07	
15	3	25.7	.1867	77.	S.W.	94	2½	22	3 P	3 P	9-30 P	.17	2
16	2	27.	.2440	64.	W.	133	7	37	2 P				
17	4	30.7	.3334	54.7	N.W.	234	1	14	9 A				
18	8	39.7	.4286	60.7	S.	153	5	32	10-30 A				
19	1	45.7	.5327	62.3	S.	270	11	47	2 P	†-A	†-A	T.	
20	2	26.7	.3194	48.3	N.	114	2	20	10 A				
21	0	32.3	.2680	69.7	S.	67	1	14	1 A	9-30 A	8-30 P	.09	
22	0	37.7	.3424	71.	N.	188	9½	44	9 A	4-45 P	12 P		
23	1	32.3	.2288	81.3	N.W.	186	9½	44	6 P	0 A	12-30 P	1.25	
24	6	21.3	.2536	47.3	S.W.	143	4½	30	4 P				
25	0	35.7	.2469	86.3	S. W.	104	2	20	5-30 P	12 M	10 P	.04	T.
26	5	21.7	.1396	84.	N. W.	256	5	32	4 P				
27	6	16.3	.1207	79.	W.	256	10	45	10 A				
28	4	25.	.1793	77.3	W.	192	6	35	1 P				
29	0	39.3	.2421	87.3	S.W.	123	3	24	12 P	7 A	6-30 P	.04	T.
30	9	23.3	.2352	59.	W.N.W	252	11½	48	1 P				
31	3	31.7	.3704	53.	S. W.	185	6½	36	3 P				

†Early morning. T=trace.

REMARKS.

The mean temperature at Amherst was about 10° above normal and the precipitation much below the normal. The warm weather during the first part of the month started the buds so that many were injured during the cold weather which followed, peach buds especially. The ground is nearly settled and plowing is being done. The most brilliant aurora ever witnessed in Massachusetts was seen on the 30th inst.

The following is furnished by the N. E. Weather Service:

The weather of the past month has been abnormal in many ways. Never before at Boston, in the history of the weather bureau, has the mean temperature for the month of March been so high; never has the mean for the three consecutive warmest days, or the mean for any single day been so great, and never has the total precipitation for the month been so small.

The daily mean temperature for the month was 13° above the normal, being 27° above on the 19th. It was above the normal from the 1st to 23d inclusive, below on the 24th, above on the 25th, below on the 26th to 30th, and above on 31st. On the 27th the temperature fell to 20° at Boston and did not rise above 32° at any time during the day; the mean for this day was 12° below the normal.

The precipitation was less than one inch and was almost three and one-half inches below the usual amount for the month. The wind movement was unusually small, and the maximum for the month only 36 miles an hour, occurring on the 16th from the west.

Eleven cyclonic and nine anticyclonic areas influenced our weather for the month. Eight of the former passed to the north of Massachusetts and two passed over our district in the form of a long, low, pressure trough. The northerly movement of the storm areas, thus giving us prevailing southerly winds, explains the high temperature for the month.

The cold wave of the 26th was widespread, and in other sections very injurious. It came with the eighth high pressure area for the month which spread from the far Northwest over the entire central and eastern parts of the country on the 26th and 28th. On the morning of the 27th the freezing line had moved south to the Gulf of Mexico, the mercury indicating only 18° at Atlanta, Ga., and 32° at Jacksonville, Fla. Reports indicate that in Massachusetts the fruit buds were not advanced enough to be injured by this cold snap except possibly peaches; these were severely injured during the cold spell in February and were undoubted further damaged this month.

The aurora of the 30th was one of the most brilliant ever witnessed in eastern Massachusetts. The streamers covered the entire heavens most of the time from 8 to 9 P. M.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No 64. APRIL, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.23, 30th, 8 A.
Actual minimum reading,	29.37, 1st, 3 A.
Mean reduced to sea level,	30.054
Monthly range,	.86

**Air Temperature.* In Degrees Fahr.

Highest,	75.; 79.; 27th
Lowest,	23.; 16, 3rd
Mean,	47.9; 46.7.
Monthly Range,	52. ; 63.
Highest mean daily,	61.4; 56.
Lowest mean daily,	35.4; 31.3
Mean maximum,	55.8; 58.2
Mean minimum,	40.2; 35.2
Mean daily range,	15.7; 23.1
Greatest daily range,	32. ; 41.
Least daily range,	3. ; 6.5

Humidity.

Mean dew point,	34.2
Mean force of vapor,	.3742
Mean relative humidity,	60.5

Wind.

Prevailing Directions.

North,	20 per cent.
South West,	14 " "
South,	12 " "
South South West,	9 " "
Other directions,	45 " "
Total movement,	4105 m.
Greatest daily movement,	443 m., 13th.
Least daily movement,	28 m.; 28th.
Mean daily movement,	136.8 m
Mean hourly velocity,	5.7 m

Maximum pressure per square foot, 15¼ lbs. = 56m. per hour, 13th, at 4-30 P.

**Precipitation.* In inches.

Total precipitation,	.85; 1.83

Weather.

Mean cloudiness observed,	53.4 per cent.
Number of clear days,	11
Number of fair days,	2
Number of cloudy days,	17
Total cloudiness recorded by the Sun Thermometer,	228 hours or 56.7 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	12
Number of inches of snow on the ground at the close of the month,	0
Frost,	7th, 10th, 16th, 17th.

Bright Sunshine.

Number of Hours recorded,	174
Rain,	1st, 4th, 6th, 12th, 13th, 19th, 20th, 21st, 22nd, 24th, 27th, 28th.
Rainbow,	21st, 24th.
Snow,	6th, 7th, 8th, 11th, 12th.
Total fall in inches,	6
Thunder and Lightning,	27th, 28th.
Mean Ozone,	22 per cent.

Halos.

Solar,	1st, 16th, 30th.
Lunar,	16th, 18th.

Gales, of 35 or more miles per hour, 47, 1st, W.; 42, 9th, N.; 49, 11th, N.N.E.; 48, 12th N.N.E; 56, 13th, N.E.; 42, 14th, N.N.E.; 35, 26th, W.; 45, 29th, N

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	29.82	29.66	29.727	58.	60.	1 P	41.	40.	12 P	50.9	20
2	30.28	29.82	30.047	43.	45.5	4 P	30.	27.	12 P	38.1	30
3	30.42	30.25	30.33	48.	46.5	5 P	23.	16.	5 A	35.4	40
4	30.28	29.83	29.94	48.	49.	6 P	36.	30.	1 A	42.3	20
5	29.98	29.81	29.883	49.	53.	10 A	44.	39.	6 A	47.1	20
6	30.14	29.96	30.017	43.	47.5	3 P	37.	33.5	11 P	40.1	0
7	30.56	30.14	30.19	49.	50.	3 P	31.	25.5	5 A	38.8	30
8	30.23	30.10	30.153	36.	37.5	1 P	33.	31.	10 P	34.4	10
9	30.30	30.18	30.25	42.	46.	5 P	33.	29.	1 A	36.9	20
10	30.31	29.07	30.21	47.	48.	2 P	34.	27.	6 A	40.7	30
11	30.07	30.83	29.907	39.	40.	1 A	33.	30.	7 P	36.3	20
12	30.02	29.89	29.953	38.	39.	3 P	35.	30.	1 A	36.1	20
13	30.01	29.85	29.91	48.	52.	12 M	37.	35.	1 A	41.2	20
14	30.02	29.90	29.937	51.	55.	2 P	41.	37.	1 A	46.3	30
15	30.09	30.00	30.05	62.	65.	5 P	42.	38.	6 A	51.4	40
16	30.15	30.04	30.117	66.	69.	4 P	34.	28.	6 A	52.3	40
17	30.29	30.16	30.20	69.	70.	5 P	40.	31.	6 A	53.6	30
18	30.35	30.22	30.29	66.	69.	4 P	43.	34.5	6 A	53.7	30
19	30.28	30.05	30.137	63.	66.	4 P	46.	42.	5 A	53.9	20
20	30.10	29.92	29.997	67.	70.	2 P	51.	48.	5 A	57.	20
21	29.92	29.80	29.857	59.	60.	10 A	48.	43.	3 A	54.9	10
22	29.89	29.78	29.823	59.	61.5	5 P	47.	45.	4 A	51.8	20
23	29.96	29.85	29.923	58.	61.	2 P	48.	44.	12 P	53.3	10
24	30.04	29.91	29.96	60.	65.	5 P	47.	42.	3 A	51.9	20
25	30.18	30.04	30.13	63.	66.	7 P	46.	39.	6 A	53.7	20
26	30.17	30.03	30.09	69.	70.	7 P	42.	33.	7 A	54.9	20
27	30.09	29.92	30.007	75.	79.	5 P	46.	39.	7 A	61.4	10
28	29.98	29.85	29.933	70.	71.	1 P	50.	43.	6 A	56.9	10
29	30.40	29.99	30.287	62.	64.	3 P	49.	45.	12 P	56.	20
30	30.52	30.24	30.383	68.	71.5	4 P	38.	30.5	5 A	54.8	30

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	5	33.7	.3704	57.	N.W.	232	11	47	9 A	6-45 A	7-30 A	.02	
2	12	16.3	.1616	53.	N. W.	177	5	32	5 P				
3	12	18.3	.2324	48.7	S.W.	69	4	28	9 P				
4	0	39.	.3191	76.	S.S.W.	115	3	24	4 P	7-30 A	8-30 P	.37	
5	1	35.	.3081	66.3	W.	105	5	32	10 A				
6	0	28.3	.2434	66.7	N.N.W.	117	5	32	3 P	8 A	1 P	.01	T.
7	7	29.	.2604	67.3	S. W.	43	3	24	5 P	7 P	12 P		
8	0	29.	.2593	84.3	N.	88	5	32	4 P	0 A	7 P	.51	4
9	7	26.	.2268	63.7	N.	298	9	42	12 M				
10	1	24.3	.2771	49.1	E.	128	4	28	9 A				
11	0	25.3	.2091	67.7	N. E.	355	12	49	5-30 P	2-15 P	12 P		
12	0	31.	.2169	79.7	N.N.E.	378	11½	48	1 A	0 A	12 P		
13	0	32.7	.2864	66.	N.N.E.	443	15½	56	4-30 P	0 A	7-30 P	.17	2
14	2	32.3	.3453	55.	N.	247	9	42	11 A				
15	13	25.	.4057	34.	N.	90	5	32	8 A				
16	12	28.3	.4067	49.3	N.N.W.	57	4	28	12 M				
17	13	33.7	.4154	52.7	S. W.	74	5	32	7-30 P				
18	12	36.3	.4288	55.7	S.S.W.	93	5½	33	5 P				
19	2	44.7	.5161	59.3	S.	122	4	28	7 P	5 P	6 P	T.	
20	1	54.7	.5604	78.	S.S.W.	56	4	28	12 P	4 P	4-30 P	.03	
21	0	53.	.4794	85.	S.W.	124	5½	33	1 A	†-A	12 P		
22	1	49.	.4126	83.7	N.	30	1½	17	8 P	0 A	6-30 P	.70	
23	1	44.3	.4141	73.7	S.W.	34	1	14	3 P				
24	2	43.	.4124	69.	N.N.W.	105	5	32	1-30 P	12 M	5-30 P	T.	
25	13	27.	.4389	36.	N.	88	5	32	1 A				
26	13	32.7	.5284	37.	N.	59	6	35	2 P				
27	13	46.	.6381	55.7	S.W.	73	5	32	2 P	8 P	8-30 P	.02	
28	3	48.	.5482	63.3	N.	28	3½	26	7 P	3 P	6 P	.T	
29	14	19.7	.4082	27.7	N.	202	10	45	3 P				
30	14	39.	.4957	55.7	S.	75	4	28	4-30 P				

†Early morning. T=trace.

REMARKS.

The month has been unusually warm and dry. The temperature was about 3° above normal while the precipitation measured about one-half the average for April for the period of sixty years.

Vegetation is forward and fruit trees, with the exception of peach trees, indicate an abundant harvest. The last frost was recorded on the seventeenth. Farmers are ahead with their work.

The following report is furnished by the New England Weather Service:

The weather for April has been very favorable for all farm work and for seeding. The month as a whole has been warm with plenty of sunshine, while the precipitation has been below the usual amount except on the immediate coast.

Five cyclonic and six anticyclonic areas influenced the weather. Of the former two passed eastward to the north of New England, causing southerly winds and warm rains; one moved across our district from west to east with general rains, and two passed easterly to the south of us, one moving directly east onto the ocean and the other curving northerly up our seaboard. Both of the last named gave northerly winds and snow. The amount of snow was least in the western section and heaviest along the coast; it came as a surprise but probably did much more good than harm, as it supplied much needed moisture. At the end of the month, there is a general complaint of the dryness of the ground and of the lack of water in springs and wells. There is a deficiency of several inches in the rainfall since the first of January in the greater part of the state. In eastern Maine this deficiency amounts to ten inches, but it is much less in Massachusetts.

The nights have been cool with frost during the last week. This has served to hold the fruit buds somewhat in check, notwithstanding the warm sunshiny days, and it is hoped they will be able to stand any frost that is generally expected in May. It is generally reported that peaches were injured to the extent of 60% to 80% by the cold wave in February, but other fruits now promise very well. A report comes from Grafton, Mass. of raspberry bushes being badly winter killed. At the end of the month the season, both in the appearance of vegetation and the farm work on the land is fully ten days ahead of the average.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 65. MAY, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.21, 12th, 8 A.
Actual minimum reading,	29.28, 25th, 4 A.
Mean reduced to sea level,	30.00
Monthly range,	.93

**Air Temperature.* In Degrees Fahr.

Highest,	81.; 85.; 1st
Lowest,	35, 22nd; 29, 15th
Mean,	58.6; 57.3.
Monthly Range,	46. ; 56.
Highest mean daily,	70.7; 68.2
Lowest mean daily,	49.6; 48.
Mean maximum,	68.5; 70.3
Mean minimum,	48.4; 44.3
Mean daily range,	20.1; 26.
Greatest daily range,	35. ; 43.
Least daily range,	8. ; 9.5

Humidity.

Mean dew point,	52.6
Mean force of vapor,	.4979
Mean relative humidity,	65.8

Wind.

Prevailing Directions.

South West,	19 per cent.
North,	15 " "
South,	13 " "
North West,	12 " "
Other directions,	41 " "
Total movement,	2180 m.
Greatest daily movement,	229 m., 7th.
Least daily movement,	1 m.; 23rd.
Mean daily movement,	70 m.
Mean hourly velocity,	3 m.

Maximum pressure per square foot, 14½ lbs. = 54m. per hour, 7th, at 12 M.

**Precipitation.* In inches.

Total precipitation,	2.92; 4.00

Weather.

Mean cloudiness observed,	52 per cent.
Number of clear days,	10
Number of fair days,	7
Number of cloudy days,	14
Total cloudiness recorded by the Sun Thermometer,	27.8 hours or 57 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	13

Frost, ... 15th, 22nd.

Bright Sunshine.

Number of Hours recorded, ... 208

Rain, . . 4th, 6th, 8th, 11th, 18th, 19th, 20th, 23rd, 24th, 25th, 28th, 29th, 30th, 31st.

Thunder and Lightning, ... 2nd, 6th, 18th, 19th.

Mean Ozone, ... 23.5 per cent.

Halos.

Solar,	14th, 16th.
Lunar,	16th.

Gales, of 35 or more miles per hour, 35, 2dd, W.N.N.; 54, 7th, W.N.W.; 35, 8th, N.W. 42, 9th, N.W.; 30, 13th, N.; 37, 14th, N.; 36, 15th, N.; 35, 20th, N.E.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.23	29.97	30.067	81.	85.	4 P	52.	47.	5 A	67.7	30
2	29.97	29.82	29.893	81.	84.5	3 P	59.	52.	4 A	70.7	40
3	30.26	29.97	30.18	76.	74.	6 P	53.	52.	12 P	63.2	30
4	30.28	30.11	30.19	65.	67.5	2 P	48.	43.	5 A	55.9	30
5	30.17	29.98	30.083	79.	79.5	4 P	50.	46.	6 A	62.2	20
6	29.98	29.69	29.803	67.	69.	4 P	53.	49.	5 A	59.4	20
7	29.83	29.62	29.72	73.	77.5	11 A	60.	58.	4 A	64.8	10
8	29.89	29.76	29.817	71.	74.5	4 P	58.	53.	3 A	63.7	20
9	30.20	29.89	30.043	70.	70.5	5 P	50.	44.	6 A	62.8	30
10	30.47	30.20	30.367	74.	73.	5 P	47.	38.	5 A	59.2	40
11	30.47	30.34	30.383	64.	64.	6 P	45.	37.	6 A	55.7	30
12	30.50	30.22	30.363	76.	76.	6 P	41.	33.	6 A	59.8	40
13	30.22	30.01	30.117	76.	79.5	2 P	53.	47.	4 A	64.	30
14	30.26	30.02	30.13	63.	67.	5 P	45.	36.	4 A	54.	30
15	30.06	29.84	29.913	65.	67.	4 P	37.	29.	5 A	52.9	50
16	29.90	29.77	29.827	72.	73.	3 P	40.	33.	5 A	59.	30
17	29.84	29.77	29.817	74.	76.5	2 P	44.	37.	5 A	60.6	10
18	29.83	29.71	29.77	68.	70.	6 P	58.	55.	5 A	61.5	10
19	30.17	29.71	29.833	65.	69.	1 P	56.	57.	12 P	59.2	10
20	30.33	30.18	30.25	56.	61.	1 A	45.	45.	12 P	50.	10
21	30.36	30.31	30.337	56.	61.	2 P	42.	43.	12 P	49.6	20
22	30.35	30.08	30.187	70.	71.	3 P	35.	32.	5 A	54.6	20
23	30.08	29.90	29.952	68.	67.	6 P	51.	49.	5 A	58.6	20
24	29.90	29.62	29.76	58.	60.5	1 A	50.	51.	12 P	54.9	30
25	29.82	29.57	29.67	59.	61.	11 A	50.	48.5	1 A	54.2	10
26	29.99	29.82	29.89	62.	64.	1 P	48.	33.	4 A	56.4	10
27	29.99	29.92	29.953	78.	77.	6 P	47.	42.5	5 A	62.6	20
28	29.96	29.78	29.887	73.	75.5	2 P	54.	51.	4 A	63.4	20
29	30.08	29.78	29.907	64.	64.	5 P	43.	41.5	6 A	53.1	10
30	30.08	29.91	30.017	66.	66.	3 P	40.	36.	4 A	54.4	30
31	29.92	29.74	29.86	55.	56.	1 A	46.	45.	6 A	50.5	20

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	12	49.7	.7972	47.7	S. W.	83	3	24	4-30 P				
2	7	51.7	.7798	53.	S.	92	6	35	1-30 P				
3	8	49.7	.5853	62.3	S.W.	62	4	28	9 A				
4	1	47.7	.5108	69.	S. W.	22	2½	22	2-30 P	4 P	8-30 P	.22	
5	8	50.7	.6413	61.7	S. W.	47	3½	26	9 P				
6	0	56.3	.5518	82.3	S.S.W.	94	5	32	9 P	†—A	9-30 P	.24	
7	10	48.3	.6424	58.7	S. W.	229	14½	54	12 M				
8	12	42.7	.6399	50.7	N.W.	109	6	35	6 P	†—A	†—A	.03	
9	14	38.3	.4746	51.7	N.W.	102	9	42	10 A				
10	14	41.	.5059	53.	S. W.	49	3	24	6 P				
11	4	44.3	.4303	68.	S.W.	69	3½	26	10-30 A	12-25 P	1-15 P	.05	
12	14	32.	.5637	41.	S.W.	24	1	14	3 P				
13	12	38.7	.6659	42.7	N.	152	7½	39	7 P				
14	10	23.7	.4301	31.	N.	131	7	37	4 P				
15	14	32.	.4314	44.	N.	123	6½	36	6 P				
16	12	41.3	.5060	55.3	W.N.W	30	3	24	2 P				
17	5	46.3	.5885	60.7	S.W.	43	3	24	4 P				
18	0	56.	.5576	80.7	S.W.	54	2	20	10-30 A	†—A	12 P		
19	0	57.	.5381	86.	N. E.	27	2	20	10 P	0 A	12 P		
20	0	44.3	.3477	84.3	N.E.	168	6	35	6 A	0 A	†—A	1.43	
21	5	42.7	.3814	74.	N.E.	171	4½	30	2 P				
22	12	46.	.4549	74.	S.W.	4	1	14	2 P				
23	4	56.7	.4978	94.3	N.W.	1	0	—	—	†-A	2-30 P	.38	
24	0	51.7	.4412	87.3	E.S.E.	33	3	24	8-30 A	7-30 A	12 P		
25	0	51.	.4404	85.7	N.	3	1	14	8 P	0 A	6-15 P	.48	
26	1	49.7	.4746	76.	N.E.	4	0	—	—				
27	14	51.	.6481	62.7	N.	3	0	—	—				
28	5	53.7	.6625	65.7	S.W.	116	5½	33	4-30 P	8-45 P	12 P		
29	7	42.	.4229	67.	N.	61	4	28	1 P	0 A	6-30 A	.82	
30	3	48.3	.4560	78.7	S.	26	2	20	6 P	1 P	12 P		
31	0	47.7	.3703	90.3	N.	48	1	14	12 M	0 A	9-30 P	.35	

†Early morning. T=trace.

REMARKS.

The weather during the first two weeks was warm and dry, very little rain fell from the first to the eighteenth of the month; during the last two weeks wet and cool weather prevailed. The mean temperature for the month was slightly above the normal as was also the rainfall. Frost occurred on the fifteenth and twenty-second, and considerable damage was done to early vegetables.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No 66. JUNE, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.05, 14th, 8 A.
Actual minimum reading,	29.30, 21st, 7 A.
Mean reduced to sea level,	9.997
Monthly range,	.75

**Air Temperature.* In Degrees Fahr.

Highest,	92 ; 93.; 17th
Lowest,	43; 37.5 8th
Mean,	69.4; 67.8.
Monthly Range,	49.; 55.5
Highest mean daily,	82.9; 78.5
Lowest mean daily,	55.4; 52.5
Mean maximum,	79.3; 79.6
Mean minimum,	59.4; 56.
Mean daily range,	19.8; 23.6
Greatest daily range,	31.; 39.
Least daily range,	9.; 12

Humidity.

Mean dew point,	57.9
Mean force of vapor,	.7406
Mean relative humidity,	68.1

Wind.

Prevailing Directions.

South West,	27 per cent.
South,	21 " "
West,	11 " "
North West,	11 " "
Other directions,	30 " "
Total movement,	1838 m.
Greatest daily movement,	164 m., 27th.
Least daily movement,	10 m.; 12th.
Mean daily movement,	61.3 m.
Mean hourly velocity,	2.5 m.

Maximum pressure per square foot, 4 lbs.= 53 m. per hour, 2d, at 4-30 P. M.

**Precipitation.* In inches.

Total precipitation,	1.69; 3.13

Weather.

Mean cloudiness observed,	54 per cent.
Number of clear days,	5
Number of fair days,	9
Number of cloudy days,	16
Total cloudiness recorded by the Sun Thermometer,	306 hours or 63 per cent.
Number of days on which .01 inch or more rain fell,	7

Bright Sunshine.

Number of Hours recorded,	180

Rain, 1st, 2nd, 3rd, 4th, 7th, 18th, 19th, 20th, 21st, 24th, 26th, 27th, 30th.

Hail, 2nd.

Thunder and Lightning, 18th, 19th, 27th, 30th.

Mean Ozone, 17 per cent.

Halos.

Lunar,	14th.

Gales, of 35 or more miles per hour, 53, 2nd, S.S.E.; 35, 3rd, N.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.72	29.58	29.627	65.	67.	7 P	50.	49.	1 A	56.8	30
2	29.74	29.63	29.69	62.	64.	11 A	51.	49.	5 A	57.5	20
3	29.74	29.66	29.693	70.	67.	7 P	47.	48.	5 A	63.7	20
4	29.87	29.62	29.77	72.	77.	2 P	54.	52.	12 P	64.5	10
5	30.00	29.76	29.86	68.	68.	6 P	46.	40.	5 A	55.4	20
6	30.01	29.81	29.937	65.	63.	1 P	47.	42.	5 A	56.1	20
7	29.89	29.77	29.827	65.	66.	4 P	49.	44.	5 A	56.	10
8	30.09	29.89	30.07	70.	71.5	3 P	43.	37.5	5 A	59.7	30
9	30.13	30.03	30.07	81.	82.	3 P	53.	49.	5 A	68.1	20
10	30.21	30.07	30.137	85.	85.	4 P	55.	55.	5 A	71.7	10
11	30.12	29.97	30.053	89.	90.5	3 P	71.	64.	5 A	78.9	20
12	30.12	30.01	30.057	83.	83.	1 P	58.	55.	12 P	70.9	10
13	30.29	30.12	30.22	74.	70.	6 P	55.	53.	4 A	61.9	30
14	30.33	30.18	30.253	82.	82.	3 P	51.	43.	3 P	68.4	20
15	30.21	30.05	30.123	83.	85.	3 P	58.	52.	4 A	72.2	20
16	30.05	29.86	29.95	90.	91.	3 P	65.	60.	4 A	78.7	10
17	29.96	29.88	29.923	92.	93.	2 P	71.	64.	4 A	82.9	10
18	30.04	29.94	29.987	89.	91.	1 P	69.	65.	12 P	78.5	0
19	30.10	30.01	30.063	82.	86.	2 P	68.	69.	12 P	73.4	10
20	30.07	29.98	30.03	84.	83.	5 P	68.	67.	1 A	74.8	10
21	30.07	30.00	30.04	85.	82.	5 P	65.	60.	4 A	74.2	20
22	30.09	29.98	30.027	89.	90.	7 P	64.	60.	5 A	77.6	10
23	30.20	29.94	30.053	92.	93.	5 P	70.	63.	4 A	81.2	10
24	30.29	30.21	30.253	74.	70.	1 A	60.	57.	10 P	67.2	20
25	30.29	30.09	30.143	72.	72.	5 P	59.	55.	1 A	64.7	20
26	30.10	29.93	30.007	82.	85.	3 P	66.	64.	1 A	72.8	20
27	29.93	29.82	29.877	87.	85.	9 P	71.	70.	1 A	76.6	10
28	30.05	29.92	29.997	88.	86.	7 P	68.	65.	5 A	76.8	20
29	30.15	30.05	30.117	76.	76.	4 P	67.	64.	8 A	70.7	30
30	30.11	29.90	30.07	83.	85.5	3 P	66.	65.	9 P	70.1	20

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	1	47.7	.4831	69.	S. W.	88	4½	30	10 A	11-30 A		T.	
2	1	51.7	.4514	86.7	S.S.E.	81	14	53	4-30 P	8 A	12 P		
3	8	49.7	.5281	69.3	W.N.W	104	6	35	12 M	0 A	†—A	1.35	
4	9	52.	.6089	67.7	N.W.	141	5½	33	1 P	7 A	7-30 P	.05	
5	3	44.7	.4324	74.	N.W.	20	5½	33	7-30 P				
6	5	42.	.4757	59.3	S.W.	23	2	20	5 P				
7	3	41.7	.4383	63.3	N.W.	62	4	28	5 P	3 P		T.	
8	4	43.	.5517	56.	N.W.	36	4	28	1 P				
9	9	49.	.7046	53.3	S. W.	62	3	24	2 P				
10	13	52.3	.8559	54.	W.	39	3	24	1-30 P				
11	9	60.3	.9906	56.	N.W.	82	4	28	4 P				
12	0	58.7	.8141	63.3	N.E.	10	1	14	8 P				
13	4	51.7	.5735	68.3	N.E.	66	2½	22	8 A				
14	14	53.7	.6884	64.7	S.S.W.	21	1	14	5 P				
15	4	59.3	.8655	61.7	W.	68	1	14	2 P				
16	8	64.3	1.0769	61.7	W.	32	½	10	12 M				
17	14	69.3	1.1769	62.3	S.	40	2	20	4 P				
18	6	67.7	1.0235	68.3	S.	91	5	32	3 P	2-30 P		T.	
19	4	67.	.9358	72.7	S.	107	4	28	4 P	3 P	12 P		
20	6	63.3	.9073	67.3	S.W.	87	3	24	2 P	0 A	†—A	.44	
21	10	64.7	.8988	70.	S.W.	30	1½	17	11 A	9 A	9-30 A	.02	
22	14	64.3	1.0205	63.7	W.	29	1	14	6 P				
23	12	64.	1.1072	56.7	N.W.	62	3	24	2 P				
24	0	56.	.5981	78.	E.S.E.	44	1	14	7 A	5-45 P	6 P	T.	
25	2	59.3	.6389	80.	S.	65	1	14	3 P				
26	4	69.7	.8979	81.7	S.W.	84	4½	30	3 P	5 P		T.	
27	1	70.3	.9358	78.	S.W.	164	4½	30	8 A	9 A		T.	
28	8	69.3	.8698	80.7	N.	25	3½	26	1 P				
29	0	64.3	.7805	77.7	E.	19	0	—	—				
30	4	67.	.8887	77.7	S.	56	5	32	4 P	3-15 P	4-15 P	1.27	

†Early morning. T=trace.

REMARKS.

The temperature for the month was about 3° above the normal, the highest means occurring on the 11th, 16th, 17th, 18th, and 23d. The rainfall was six tenths of an inch below the normal and occurred mostly on the 3d, 4th, and 30th; on the last date a heavy thunder shower was recorded. The middle of the month was dry and hot. The following was furnished by the New England weather service:

The controlling agent of the weather for Massachusetts for the month of June was an area of high barometric pressure which moved from the central Mississippi valley to the southern Atlantic coast on the 8th, then held there, shifting slightly back and forth, till near the end of the month. It appeared to deflect the storms northward, and there was a drifting line of low pressure areas moving eastward to the north of us. With the adjustment of the air pressure the prevailing winds were of course from the south and they came across our section generally dry and hot with but few clouds to obstruct the scorching rays of the sun. On two occasions, the 24th and 29th, small anticyclones spread across northern New England, causing cool northeasterly winds and clouds along the coast,but the relief was only temporary. At Boston the mean temperature averaged nearly 3° a day above the normal while at Fitchburg it was nearly 2° above. The mean day temperatures averaged much higher comparatively, because for the most part the clear sky allowed free radiation of heat from the ground at night and a consequent lowering of the night air temperatures—holding the mean for the day down near the normal. The precipitation at Fitchburg was 1.00 inch and was 1.75 inches below the usual amount. At Boston the total was only .80 inch and was 2.42 less than usual. At Concord, Mass., only about half an inch fell. Local showers prevailed in the western counties and in some parts of the eastern giving some relief to the crops, but in other places especially in the east almost no rain has fallen for weeks and everything is suffering.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 67. JULY, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.03, 27th, 7 A.
Actual minimum reading,	29.48, 13th, 4 P.
Mean reduced to sea level,	30.012
Monthly range,	.55

[*]*Air Temperature.* In Degrees Fahr.

Highest,	97.; 98.; 20th
Lowest,	52., 9th; 48., 23rd
Mean,	73.5; 72.9
Monthly Range,	45.; 50.
Highest mean daily,	82.5; 84.
Lowest mean daily,	62.5; 60.5
Mean maximum,	84.5; 85.5
Mean minimum,	63.2; 60.3
Mean daily range,	21.3; 25.3
Greatest daily range,	30.; 34.
Least daily range,	13.; 14

Humidity.

Mean dew point,	62.4
Mean force of vapor,	.8852
Mean relative humidity,	68.2

Wind.

Prevailing Directions.

South West,	22 per cent.
South,	22 “ “
West,	13 “ “
South East,	12 “ “
Other directions,	31 “ “
Total movement,	1109 m.
Greatest daily movement,	130 m., 13th.
Least daily movement,	2 m.; 16th.
Mean daily movement,	36.0 m.
Mean hourly velocity,	1.5 m.

Maximum pressure per square foot, 9½ lbs.= 44 m. per hour, 13th, at 1 P. M.

[*]*Precipitation.* In inches.

Total precipitation,	.99; 1.55

Weather.

Mean cloudiness observed,	50 per cent.
Number of clear days,	10
Number of fair days,	9
Number of cloudy days,	12
Total cloudiness recorded by the Sun Thermometer,	225 hours or 50 per cent.
Number of days on which .01 inch or more rain fell,	12

Bright Sunshine.

Number of Hours recorded,	237
Rain,	3rd, 4th, 6th, 8th, 12th, 14th, 15th, 16th, 17th, 21st, 22nd, 24th, 25th, 29th.
Hail,	25th.
Thunder and Lightning,	3rd, 4th, 6th, 14th, 16th, 17th, 18th, 21st, 25th, 29th.
Rainbow,	8th, 25th.
Mean Ozone,	17 per cent.

Halos.

Lunar,	22nd.

Gales, of 35 or more miles per hour, 37, 4th, W.; 35, 6th, S.W; 44, 13th, W; 39, 14th, N; 40, 17th, E: 40, 21st, N. N. E.

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[*] The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.14	30.03	30.083	90.	91.5	5 P	66.	64.	1 A	76.8	10
2	30.13	30.00	30.06	88.	90.	3 P	68.	66.	5 A	78.1	10
3	30.00	29.81	29.87	89.	85.	7 P	68.	52.	12 P	75.7	0
4	29.92	29.79	29.853	84.	86.	7 P	60.	54.	5 A	73.5	10
5	29.96	29.86	29.913	79.	77.	7 P	63.	63.	5 A	69.4	40
6	29.97	29.79	29.877	75.	76.	3 P	55.	53.	5 A	67.5	20
7	29.94	29.75	29.83	76.	79.	4 P	60.	50.	12 P	67.7	10
8	30.12	29.94	30.033	68.	68.	2 P	54.	53.	5 A	62.5	30
9	30.17	30.12	30.153	78.	75.	6 P	52.	55.	5 A	65.2	10
10	30.16	30.06	30.103	78.	81.	3 P	53.	52.	5 A	67.2	10
11	30.09	29.97	30.033	84.	85.	5 P	54.	52.	5 A	71.4	20
12	30.00	29.86	29.907	82.	83.	7 P	69.	66.	4 A	74.2	10
13	29.89	29.74	29.817	94.	95.	5 P	72.	70.	5 A	82.5	20
14	29.97	29.85	29.897	80.	82.	1 P	66.	64.	12 P	73.6	20
15	30.08	29.97	30.037	87.	87.	3 P	61.	57.	5 A	74.1	10
16	30.17	30.08	30.13	85.	86.	2 P	63.	64.	4 A	74.	10
17	30.21	30.13	30.187	90.	89.	4 P	61.	65.	4 A	74.7	20
18	30.23	30.13	30.173	85.	88.	2 P	68.	64.	4 A	75.3	10
19	30.13	29.97	30.04	93.	95.	5 P	66.	63.	5 A	79.8	20
20	29.99	29.76	29.87	97.	98.	5 P	68.	65.	5 A	81.6	10
21	29.95	29.80	29.847	85.	86.	2 P	63.	63.	10 P	72.4	30
22	30.08	29.95	30.05	77.	78.	7 P	59.	63.	12 P	66.2	20
23	30.14	30.08	30.12	79.	82.	3 P	54.	48.	5 A	68.2	20
24	30.12	29.95	29.993	78.	77.	6 P	60.	58.	6 A	67.4	10
25	30.11	29.98	30.067	87.	90.	4 P	66.	62.	4 A	74.2	30
26	30.28	30.11	30.22	84.	87.	5 P	67.	63.	5 A	75.3	40
27	30.31	30.17	30.233	88.	88.	5 P	62.	57.	5 A	75.2	20
28	30.18	29.97	30.047	93.	97.	3 P	74.	71.	1 A	81.5	20
29	29.98	29.82	29.927	92.	95.5	3 P	73.	68.	5 A	81.5	0
30	30.01	29.93	29.973	86.	88.	3 P	70.	66.	5 A	77.6	30
31	30.04	29.97	30.023	87.	87.	1 P	64.	57.	5 A	74.8	10

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	9	66.3	.9982	69.3	S.	39	3	24	2 P				
2	9	71.7	1.0524	76.7	S.W.	60	4	28	4-30 P				
3	2	64.7	.8197	75.	S.W.	29	2	20	1 P	†— A	1-15 P	.10	
4	8	58.	.8436	60.	W.	27	7	37	4 P	8-30 P	8-45 P	.06	
5	15	60.3	.7429	71.	W.	69	3	24	10 A				
6	5	59.	.7254	71.3	S.W.	73	6	35	3 P	12-30 P	1 P	.07	
7	5	53.7	.7005	61.7	N.W.	77	3	24	6 P				
8	4	51.7	.5604	70.	W.	27	2	20	10-30 A	8-30 P	8-45 P	.01	
9	7	52.3	.6396	64.7	S.W.	6	1	14	12 M				
10	6	54.7	.6792	68.7	W.	11	1½	17	4 P				
11	4	55.7	.8131	60.	S.W.	37	2	20	1 P				
12	0	64.3	.8966	67.7	S.W.	92	2	20	6 P	10 A		T.	
13	15	64.7	1.1521	59.7	S.W.	130	9½	44	1 P				
14	3	65.3	.8632	73.	N.	15	7½	39	2 P	10-15 A	10-30 A	.03	
15	1	62.3	.9096	66.	W.	10	1	14	3 P	†—A	†—A	.01	
16	9	60.7	.8671	66.	S.W.	2	1	14	4 P	9 A		T.	
17	9	62.7	.9309	66.	S.W.	12	8	40	7 P	7-15 P	7-30 P	.01	
18	1	68.7	.9302	77.7	S.W.	15	0	—	—				
19	14	64.3	1.1110	60.3	S.E.	6	0	—	—				
20	14	68.	1.2127	61.	S.E.	8	0	—	—				
21	3	66.	.8115	77.3	N.	87	8	40	2 P	8 A	12 P		
22	2	61.7	.7056	79.7	N.E.	80	3	24	10-30 A	0 A	8 A	.66	
23	14	53.7	.7299	60.3	E.	69	2	20	2 P				
24	3	62.7	.7136	81.3	N.N.W.	7	0	—	—	†—A	12 M	.15	
25	10	65.7	.9420	72.	S.W.	42	2	20	7 P	3-30 P	5-30 P	.43	
26	14	61.7	.9172	63.	N.	29	1½	27	9 A		†—A		
27	14	68.	.9596	74.3	S. W.	20	1	14	12 M		9-30 A		
28	7	71.7	1.1989	68.	S.	31	1	14	11 P				
29	9	68.3	1.1668	63.	S.	36	4	28	12 M	6-05 P	9-30 P	.02	
30	14	64.3	.9976	62.3	W.S.W.	49	4	28	11 A				
31	6	62.	.8496	67·3	N.	14	1½	17	5 P				

†Early morning. T=trace.

REMARKS.

The weather has been exceptionally warm and dry, the mean temperature was about 5° above the normal, while the mean precipitation was nearly three inches below the normal for a period of sixty years. Very little rain fell before the 22d and crops and vegetation suffered not a little. The following is furnished by the N. E. W. Service:

The weather for New England for the month of July, 1894, was influenced by the passage of six cyclonic and the same number of anticyclonic areas. All but one of the former passed easterly to the north of Massachusetts, and most of them well over Canada giving us only their southerly edge and accompanying thunderstorms. One storm passed over our district from west to east and then moved southeasterly off the coast.

At Boston the temperature was above the normal for the first few days of the month, then varied above and below until the 24th at which date it was one degree below for the month as a whole; on the 17th the temperature averaged 11° below the normal. From the 24th to 31st the heat was very great and averaged 79° a day or almost 8.5° a day above the normal; so, for the month as a whole the mean temperature has been nearly 2° a day warmer than usual. Since January 1st the excess of temperature at this station has been 594°, or about 2.8° per day warmer that the average for 24 years.

The precipitation has been .50 inch below the average for the month at Boston, and for the seven months since January 1st there has been a deficiency of 7.32 inches. The total rain at this station for July was 3.09 inches, 2.80 inches of which fell since the 21st. The total rainfall between May 24th and July 20th was less than the amount from July 21st to 31st. This rain ended a very severe and prolonged drought over the northeastern part of the state, which has done a great amount of damage to all crops. Corn withstood it better than other crops but that has suffered quite a good deal. In the southeastern part of the state on the Cape the drought continues and is almost unprecedented in length and severity. In Western Massachusetts much more rain fell during the first part of the month and crops have suffered little if any until the present time when a rain would be very beneficial.

C. D. WARNER, Meteorologist.
FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 68. AUGUST, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	29.96, 6th, 6 A.
Actual minimum reading,	29.52, 3rd, 5 P.
Mean reduced to sea level,	30.033
Monthly range,	.44

**Air Temperature.* In Degrees Fahr.

Highest,	89.; 91.; 23rd
Lowest,	46; 37., 22nd
Mean,	69.3; 68.
Monthly Range,	43.; 54.
Highest mean daily,	75.8; 76.
Lowest mean daily,	59.8; 59.
Mean maximum,	79.8; 81.6
Mean minimum,	59.; 54.3
Mean daily range,	21.; 27.
Greatest daily range,	35.; 45.
Least daily range,	5.; 11

Humidity.

Mean dew point,	58.6
Mean force of vapor,	.7547
Mean relative humidity,	69.9

Wind.

Prevailing Directions.

South,	25 per cent.
South West,	19 " "
North,	17 " "
North West,	13 " "
Other directions,	26 " "
Total movement,	1920 m.
Greatest daily movement,	130 m., 21st.
Least daily movement,	4 m.; 6th.
Mean daily movement,	62.0 m.
Mean hourly velocity,	2.6 m.

Maximum pressure per square foot, 9½ lbs.= 44 m. per hour, 16th, at 7 A. M.

**Precipitation.* In inches.

Total precipitation,	.19; .31

Weather.

Mean cloudiness observed,	44 per cent.
Number of clear days,	12
Number of fair days,	9
Number of cloudy days,	10
Total cloudiness recorded by the Sun Thermometer,	190 hours or 41 per cent.
Number of days on which .01 inch or more rain fell,	7

Bright Sunshine.

Number of Hours recorded,	238

Rain, . . 2nd, 3rd 7th, 9th, 12th, 13th, 15th, 20th, 30th.

Frost, ... 22nd.

Thunder and Lightning, 3rd, 15th, 19th, 30th.

Mean Ozone, ... 19 per cent.

Gales, of 35 or more miles per hour, 37, 9th, N. W.; 44, 16th, N.; 37, 21st, N. W; 39, 26th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.07	30.01	30.047	86.	84.5	5 P	64.	59.	3 A	72.6	20
2	30.06	29.94	30.001	76.	78.	4 P	67.	62.	4 A	71.2	0
3	29.94	29.80	29.863	84.	84.	4 P	70.	67.	12 P	75.2	10
4	30.12	29.91	30.033	75.	78.5	5 P	63.	61.	12 P	68.	30
5	30.21	30.12	30.063	81.	81.	6 P	59.	51.5	6 A	68.3	20
6	30.24	30.10	30.173	88.	88.	6 P	54.	47.	5 A	70.7	40
7	30.14	29.99	30.06	86.	89.	3 P	57.	51.5	5 A	72.9	10
8	30.03	29.88	29.94	88.	89.5	3 P	66.	61.	5 A	75.8	30
9	30.05	29.85	29.923	80.	81.5	10 A	57.	60.	12 P	71.	0
10	30.16	30.05	30.11	75.	78.	5 P	51.	44.	5 A	63.1	20
11	30.24	30.16	30.207	82.	81.	5 P	48.	41.	5 A	65.	10
12	30.22	30.08	30.16	74.	76.	2 P	58.	52.	6 A	65.9	10
13	30.09	29.99	30.03	75.	77.	2 P	58.	55.	3 A	74.4	10
14	30.14	30.06	30.103	81.	85.	4 P	62.	58.	4 A	71.7	0
15	30.08	29.85	29.93	76.	79.	1 P	65.	62.	1 A	69.5	0
16	29.97	29.85	29.89	75.	80.	4 P	60.	56.	12 P	68.8	0
17	30.12	29.97	30.067	82.	83.	5 P	53.	46.	6 A	66.	20
18	30.14	30.01	30.07	83.	85.	3 P	58.	53.	5 A	70.5	10
19	30.03	29.90	29.97	85.	88.	2 P	67.	64.	2 A	75.	40
20	29.94	29.86	29.90	75.	78.	5 P	65.	64.	12 P	70.9	10
21	30.06	29.94	30.033	66.	68.	4 P	51.	50.	12 P	59.8	20
22	30.13	30.06	30.10	79.	80.	4 P	46.	37.	6 A	62.5	10
23	30.18	30.08	30.133	89.	91.	4 P	54.	46.	6 A	71.5	10
24	30.15	30.01	30.08	88.	91.	4 P	64.	57.	6 A	75.6	0
25	30.07	29.93	29.997	86.	90.	2 P	64.	59.	6 A	74.8	40
26	30.13	29.97	30.04	80.	84.	4 P	59.	61.	12 P	70.	70
27	30.20	30.07	30.133	77.	77.	4 P	50.	46.	6 A	63.1	30
28	30.10	29.96	30.02	77.	79.	2 P	56.	51.	6 A	67.4	10
29	30.10	30.00	30.083	78.	78.	6 P	58.	55.	7 A	66.1	30.
30	30.03	29.87	29.923	67.	69.	3 P	62.	58.	6 A	64.3	30
31	30.07	29.90	29.973	76.	79.	4 P	55.	49.	5 A	65.5	40

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	13	57.7	.8049	62.3	N.	24	1	14	10 P				
2	0	67.3	.8091	83.	S.E.	78	3	24	5 P	8 A	4-15 P	.04	
3	0	70.	.9283	81.	S.	81	2	20	7-30 P	†—A	11 A	.08	
4	7	51.7	.6415	60.7	N.N.W.	65	4	28	4 P				
5	10	59.3	.7215	71.7	N.W.	14	1	14	12 M				
6	14	57.7	.8004	64.7	S.W.	4	½	10	6 P				
7	9	60.7	.8760	62.7	S.W.	16	1½	17	2 P	8-45 P	10 P	T.	
8	4	66.3	.9781	70.3	S.S.E.	67	1½	17	4 P				
9	3	60.	.7717	70.	N.	114	7	37	4 P	†—A	†—A	.05	
10	14	49.7	.5983	64.3	N.	67	3½	26	1 A				
11	14	54.3	.6681	66.7	S.	13	4	28	11 A				
12	2	54.3	.6440	67.3	S.S.W.	75	3	24	2 P	7-30 P	8 P	T.	
13	2	61.3	.6869	82.7	N.W.	6	0	—	—	†—A	11 A	.08	
14	9	62.7	.8615	68.3	S.	31	1½	17	1 P				
15	0	64.	.7747	79.	S. W.	88	3	24	9 A	2-20 P	2-30 P	.01	
16	7	51.	.6693	59.3	N.	119	9½	44	7 A				
17	13	51.7	.6479	64.8	N.W.	30	2	20	7 A				
18	6	60.7	.8216	69.3	S.W.	91	4	28	2 P				
19	4	66.7	.9303	74.	S.W.	92	2½	22	6 P				
20	0	63.3	.8512	70.7	S.W.	55	5	32	10 A	12-15 P	7-30 P	.02	
21	13	43.3	.4884	59.3	N.W.	130	7	37	10 A				
22	13	49.7	.5976	65.3	S.W.	11	0	—	—				
23	13	54.7	.8803	55.3	N.W.	20	0	—	—				
24	11	65.7	.9707	69.3	S.W.	53	1	14	9 P				
25	7	66.	.9264	73.	S.	127	4½	30	2 P				
26	6	57.7	.7775	64.7	N.	127	7½	39	8 A				
27	13	49.7	.6261	61.7	S.W.	61	2½	22	7-30 P				
28	12	61.	.7096	79.3	S.	31	1	14	10 P				
29	12	59.3	.6436	80.	N.	81	3½	26	1-30 A				
30	0	60.	.6258	83.3	S.	73	2½	22	7-30 A	†—A	†—A	.03	
31	7	61.3	.6606	85.3	N.W.	76	3	24	10 A				

†Early morning. T=trace.

REMARKS.

The month has been extremely dry, only thirty-one one-hundredths of an inch of rain having fallen. The normal precipitation for August for the last fifty-eight years is 4.34 inches ; therefore, the past month shows a deficiency of over four inches of rainfall. This lack of rain has caused great damage to farmers, streams and wells are dry and a water famine almost prevails. The temperature was about normal. On the 22d a light frost occurred in the lowlands but little damage was done to vegetation.

The following is furnished by the N. E. Weather Service:

The month of August, just past, was very nearly normal in temperature. No extremely high readings were recorded and cool nights were the rule. Frost has been reported from various parts of the State on the morning of the 22d, but no damage was done to vegetation. At Boston the minimum was 47° on that morning which is as low a reading as has ever been recorded during the month of August for 24 years at that station. At Concord, the temperature fell to 38° and light frost occurred in exposed places.

The rainfall was deficient throughout the State ; ponds, wells, etc. are very low. At Boston more than two-thirds of the rainfall of the month fell in less than four hours on the 20th. During that storm, which was accompanied by thunder and lightning, 0.50 inch fell in five minutes, the largest amount that has ever been recorded at Boston in that space of time since records have been kept. The storm was very local and did not extend many miles from the city.

As compared with the previous month (July) a decidedly pleasant change was noticeable.

C. D. WARNER, Meteorologist.
FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 69. SEPTEMBER, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.34, 13th, 8 A.
Actual minimum reading,	29.26, 10th, 3-30 P.
Mean reduced to sea level,	30.143
Monthly range,	1.08

**Air Temperature.* In Degrees Fahr.

Highest,	87.; 9th, 91.; 10th
Lowest,	38 ; 35., 26th
Mean,	64.8; 65.5
Monthly Range,	49.; 56.
Highest mean daily,	76.1; 76.5
Lowest mean daily,	48.7; 50.7
Mean maximum,	74.3; 77.7
Mean minimum,	56.2; 53.2
Mean daily range,	18. ; 24.5
Greatest daily range,	31.; 41.5
Least daily range,	7.; 8

Humidity.

Mean dew point,	56.2
Mean force of vapor,	.6553
Mean relative humidity,	74.4

Wind.

Prevailing Directions.

South,	12 per cent.
South West,	21 " "
North,	12 " "
South East,	11 " "
Other directions,	44 " "
Total movement,	1414 m.
Greatest daily movement,	152 m., 30th.
Least daily movement,	0 m.; 29th.
Mean daily movement,	47. m.
Mean hourly velocity,	2. m.

Maximum pressure per square foot, 13 lbs.= 51 m. per hour, 10th, at 4 P. M.

**Precipitation.* In inches.

Total precipitation,	2.38; 4.63

Weather.

Mean cloudiness observed,	53.2 per cent.
Number of clear days,	10
Number of fair days,	7
Number of cloudy days,	13
Total cloudiness recorded by the Sun Thermometer,	220 hours or 55.5 per cent.
Number of days on which .01 inch or more rain fell,	8
Frost,	26th.

Bright Sunshine.

Number of Hours recorded,	176
Rain,	6th, 8th, 10th, 14th, 15th, 16th, 19th, 20th.
Rainbow,	20th.
Thunder and Lightning,	10th, 16th, 20th.
Mean Ozone,	29.3 per cent.

Gales, of 35 or more miles per hour, 51, 10th, S. W.; 38, 11th, N.W.; 38, 20th, S. W; 35, 24th, W.

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*The first figures denote readings at top of tower, the second at base.

DAIY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.19	30.07	30.143	77.	80.	3 P	54.	47.	6 A	67.	40
2	30.23	30.03	30.097	81.	84.	1 P	61.	54.	6 A	71.4	30
3	30.36	30.23	30.323	72.	74.	3 P	59.	55.	12 P	64.8	20
4	30.32	30.14	30.197	79.	83.	2 P	57.	51.	2 A	67.5	20
5	30.14	30.04	30.08	83.	86.	3 P	66.	63.	1 A	73.7	20
6	30.18	30.07	30.13	82.	87.	4 P	64.	62.	12 P	73.	30
7	30.17	30.06	30.11	84.	88.	3 P	53.	56.	6 A	68.8	40
8	30.20	29.99	30.11	71.	88.	1 P	62.	47.	7 P	65.8	10
9	30.00	29.94	29.98	87.	90.	4 P	67.	63.	1 A	76.1	40
10	29.99	29.52	29.757	86.	91.	1 P	65.	62.	5 A	70.8	10
11	30.30	29.77	30.087	67.	73.5	3 P	53.	50.	12 P	65.9	60
12	30.54	30.30	30.453	73.	74.	5 P	45.	37.	6 A	57.7	30
13	30.63	30.54	30.583	75.	77.5	5 P	44.	36.	5 A	59.5	50
14	30.55	30.30	30.433	62.	64.5	4 P	55.	51.	6 A	58.5	10
15	30.30	30.11	30.173	82.	84.	4 P	63.	63.	1 A	71.9	30
16	30.14	30.07	30.11	80.	81.5	4 P	66.	64.	11 P	70.2	20
17	30.15	30.10	30.13	71.	74.	3 P	64.	63.	4 A	68.1	50
18	30.12	30.07	30.093	72.	73.	1 P	60.	58.	5 A	66.	30
19	30.09	29.78	30.003	68.	69.5	1 P	61.	61.	10 P	64.1	30
20	29.82	29.70	29.74	74.	78.	1 P	62.	61.	1 A	66.6	10
21	30.08	29.82	29.987	79.	81.5	5 P	61.	58.	2 A	67.6	40
22	30.17	30.08	30.117	80.	82.	3 P	55.	50.5	6 A	68.2	30
23	30.10	29.87	29.953	77.	80.	3 P	64.	62.	3 A	69.	30
24	30.15	29.91	30.053	66.	71.	1 A	51.	48.	12 P	60.4	50
25	30.50	30.15	30.323	67.	64.5	6 P	46.	42.	12 P	54.1	40
26	30.60	30.43	30.513	59.	66.5	4 P	38.	35.	6 A	48.7	40
27	30.43	30.18	30.243	63.	65.	3 P	43.	39.	3 A	53.2	30
28	30.21	30.14	30.17	71.	75.	5 P	47.	42.	3 A	57.5	10
29	30.17	30.03	30.09	80.	83.5	5 P	49.	46.	6 A	62.6	10
30	30.15	30.05	30.117	59.	63.	5 A	52.	50.	12 P	55.2	20

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	6	59.	.6999	75.7	W.	34	3	24	1 P				
2	3	58.	.7727	66.3	S.W.	28	0	—	—				
3	5	50.3	.6149	62.	S.E.	72	2	20	4 P				
4	4	59.7	.7369	73.3	S.W.	107	2½	22	1-30 P				
5	0	67.3	.8873	78.3	S.S.W.	63	1	14	2 P				
6	11	59.3	.7821	71.3	N.	20	1	14	6 A	†—A	6-30 A	.04	
7	2	56.3	.8461	62.	S.S.W.	6	0	—	—				
8	0	60.3	.6097	86.3	S.	14	1	14	1 P	10 A	4 P	.48	
9	12	65.3	.9458	71.7	S.S.E.	23	0	—	—				
10	4	65.	.9082	72.7	S.W.	109	13	51	4 P	4 P	7 P	.36	
11	12	45.	.5359	57.7	N.W.	120	7	38	2 P				
12	12	49.	.4767	76.7	S.W.	5	0	—	—				
13	12	50.3	.5679	72.	S.W.	15	1	14	7 P				
14	0	55.3	.5088	87.	S.	12	½	10	2 P	6-30 A	9 A	.17	
15	10	62.3	.8391	70.	S. W.	24	½	10	10 P	†—A	†— A	.09	
16	2	63.7	.7588	84.	S.W.	29	3	24	8 P	5 P	9-30 P	1.16	
17	1	63.3	.6635	83.7	N.N.E.	18	1	14	12 P				
18	0	62.3	.6752	84.3	N.	2	0	—	—				
19	0	59.3	.6035	84.3	N.E.	42	4	28	11 P	9 A	12 P	2.33	
20	3	64.3	.7248	86.	S.W.	92	7	38	4 P	0 A	7 P		
21	12	59.7	.7171	73.3	N.W.	10	1	14	10 A				
22	7	60.7	.7047	79.3	S.	22	2	20	7-30 P				
23	7	61.3	.7593	73.7	S.W.	119	5	32	12 M				
24	11	43.	.5009	56.	W.	147	6	35	11 A				
25	10	41.	.4082	64.3	W.	58	3½	26	3 P				
26	12	37.7	.3494	68.3	S.E.	51	1	14	11 A				
27	2	48.3	.4419	79.3	N.W.	11	½	10	10-30 A				
28	8	54.	.5429	81.3	N.W.	9	0	—	—				
29	8	55.3	.6683	72.	S.W.	0	0	—	—				
30	0	48.3	.4071	83.3	N.E.	152	5	32	7 A				

†Early morning. T=trace.

REMARKS.

The mean temperature and rainfall was much above the normal. All precipitation occurred between the 6th and 20th inclusive. The greatest quantity of rain fell on the 19th and 20th, 2.33 inches being recorded. But little frost occurred during the month and the last ten days were generally fair and warm.

The following is furnished by the New England Weather Service:

The excessive drought which had prevailed throughout Massachusetts in June continued in September until the 19th-20th when from one to two inches of rain came. The wells and springs were lower than ever before known in many sections and though this rain was not sufficient to fill them up, it wet the top of the ground and filled up streams a little. Late forage crops have been greatly benefited, the ground has been put in condition for fall plowing, and grass and grain seed has started nicely. Pastures and fields have started into new life and look quite green, and fall feed will be generally good. The month as a whole has been warmer than the normal; at Boston the excess amounts to slightly over two degrees a day. The frosts of the 26th and 27th did considerable damage in all low lands, though a great deal of the corn had been cut, and other crops that might have been injured, gathered.

At Boston the rainfall for the month was about one inch less than the normal amount. Nearly two-thirds of the whole amount for the month came during the afternoon and night of the 19th. A very heavy thunder storm passed across the northern part of the state on the 10th doing considerable damage, by lightning, water and wind. At Winchendon almost four inches of rain fell on that date, more than one inch coming in twenty minutes. Buildings were burned by lightning in Worcester and Franklin counties, roads badly washed and fruit blown off and trees injured.

C. D. WARNER, Meteorologist.
FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 70. OCTOBER, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading, 30.13, 23rd, 9 P.
Actual minimum reading, 28.94, 10th, 12-30 P.
Mean reduced to sea level, ... 30.016
Monthly range, ... 1.19

****Air Temperature.*** In Degrees Fahr.

Highest, ... 71.; 75.; 20th
Lowest, ... 39; 32., 27th
Mean, ... 52.1; 51.5
Monthly Range, ... 32.; 43.
Highest mean daily, ... 62.5, 63.5; 4th
Lowest mean daily, ... 41.4, 44. ; 15th
Mean maximum, ... 58.5; 62.6
Mean minimum, ... 45.2; 40.6
Mean daily range, ... 13.6; 22.1
Greatest daily range, ... 26. ; 37.
Least daily range, ... 2. ; 5.

Humidity.

Mean dew point, ... 44.6
Mean force of vapor, ...4075
Mean relative humidity, ... 82.7

Wind.

Prevailing Directions.

South, ... 20 per cent.
South West, ... 12 " "
North West, ... 25 " "
Other directions, ... 43 " "

Total movement, ... 2540 m.
Greatest daily movement, ... 219 m., 7th
Least daily movement, ... 1 m.; 28th
Mean daily movement, ... 82 m.
Mean hourly velocity, ... 3.4 m.
Maximum pressure per square foot, 10 lbs.= 45 m. per hour, 31st, at 3 P. M.

****Precipitation.*** In inches.

Total precipitation, ... 2.96; 4.85

Weather.

Mean cloudiness observed, . . . 44 per cent.
Number of clear days, ... 11
Number of fair days, ... 5
Number of cloudy days, ... 15
Total cloudiness recorded by the Sun Thermometer, ... 182 hours or 56 per cent.
Number of days on which .01 inch or more rain fell, ... 10
Frost, ... 8th, 16th, 18th, 19th

Bright Sunshine.

Number of Hours recorded, ... 160
Rain, . 3d, 4th, 5th, 9th, 10th, 13th, 17th, 24th, 31st.
Rainbow, ... 17th
Mean Ozone, ... 22.3 per cent.
Gales, of 35 or more miles per hour, 35, 6th, W.; 38, 11th, S.; 45, 31st, S.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.08	29.89	29.985	62.	70.	1 P	49.	47.	12 P	54.7	20
2	30.05	29.91	29.98	64.	65.	3 P	46.	41.	4 A	54.8	30
3	30.10	29.82	29.96	65.	70.	2 P	47.	42.	7 A	57.3	30
4	29.88	29.76	29.82	66.	68.	11 A	59.	58.	2 A	62.5	20
5	29.81	29.63	29.72	62.	66.	11 A	52.	49.	12 P	58.9	10
6	30.17	29.82	29.995	59.	62.	4 P	43.	43.	3 A	52.9	30
7	30.34	30.17	30.255	59.	66.5	2 P	46.	37.	6 A	52.8	40
8	30.30	29.80	30.05	65.	68.	2 P	39.	33.	5 A	53.6	20
9	29.91	29.78	29.845	61.	64.	1 A	47.	43.	12 P	55.1	10
10	29.89	29.23	29.46	51.	52.5	2 P	47.	42.	1 A	48.6	20
11	30.18	29.67	29.925	55.	58.	12 M	46.	41.	3 A	50.4	20
12	30.31	30.18	30.245	59.	63.	6 P	42.	32.	5 A	49.6	30
13	30.23	29.75	29.98	58.	58.5	12 M	44.	41.	7 A	52.0	10
14	29.78	29.59	29.685	55.	58.	1 P	42.	40.	11 P	50.7	10
15	30.10	29.78	29.94	43.	54.	3 P	40.	34.	11 P	41.4	20
16	30.10	29.52	29.71	52.	55.	4 P	37.	33.	7 A	46.0	20
17	29.70	29.41	29.555	58.	66.	11 A	49.	47.	10 P	53.1	10
18	30.16	29.70	29.93	53.	71.	12 M	41.	34.	8 A	49.4	30
19	30.27	30.13	30.21	63.	66.	4 P	37.	30.	7 A	51.5	40
20	30.15	30.08	30.115	71.	75.	4 P	47.	42.	8 A	60.0	20
21	30.32	30.15	30.235	66.	73.	3 P	49.	44.	6 A	61.0	10
22	30.41	30.30	30.355	56.	58.	3 P	50.	45.	4 A	52.9	40
23	30.42	30.35	30.385	52.	58.	3 P	48.	44.	5 A	49.9	10
24	30.35	30.28	30.315	51.	52.	2 P	47.	45.	12 P	48.9	10
25	30.31	30.03	30.17	48.	49.	12 M	46.	44.	11 P	47.2	60
26	30.03	29.90	29.965	55.	51.	3 P	46.	44.	1 A	50.8	70
27	30.10	29.92	30.01	63.	69.	3 P	39.	32.	8 A	50.3	40
28	30.18	30.10	30.14	65.	71.	5 P	40.	33.	7 A	52.1	0
29	30.15	30.06	30.105	61.	65.	2 P	41.	37.	6 A	50.9	0
30	30.27	30.15	30.21	53.	56.	1 P	43.	40.	7 A	48.3	0
31	30.28	29.53	29.855	61.	63.	4 P	48.	41.	1 A	45.2	10

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
												TOTAL IN INCHES.	
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	SNOW.
1	9	44.3	.4455	68.7	N.N.W	57	$1\frac{1}{2}$	17	4 P				
2	7	43.6	.4487	67.3	N.N.W	32	2	20	2 P				
3	2	53.	.5198	80.	S.	44	5	32	2 P	4 P	8-30 P		
4	0	58.3	.5695	86.3	S.S.E.	46	$1\frac{1}{2}$	17	1 P	0 A	12 P		
5	8	50.	.4978	75.3	S.W.	80	$3\frac{1}{2}$	26	10-30 P	0 A	7 A	1.25	
6	9	42.	.4004	67.7	W.	111	6	35	1 P				
7	11	44.6	.4207	72.7	S.	15	—	—	—				
8	3	52.3	.5101	81.0	S.	110	4	28	2 P				
9	6	44.	.3976	74.3	N.N.W	107	2	20	9 A	2 A	7-30 P	.04	
10	1	44.	.3313	87.3	N.	164	5	32	9 P	5 A	9 P	1.58	
11	5	39.3	.3534	69.7	S.	205	7	38	1 P				
12	11	41.	.3565	74.3	W.S.W	63	2	20	1 P				
13	0	53.3	.4152	87.7	S.S.E.	62	3	25	10-30 A	7 A	8 P	.31	
14	4	41.	.3390	77.3	S.S.E.	124	$5\frac{1}{2}$	33	7 P				
15	7	31.3	.2615	71.3	W.N.W	219	$4\frac{1}{2}$	30	7-30 P				
16	2	38.3	.3404	71.3	W.N.W	20	$5\frac{1}{2}$	33	9 P				
17	3	39.	.4288	59.3	S.W.	145	$5\frac{3}{4}$	34	12-30 P	2-30 P	2-45 P	.01	
18	10	37.6	.3508	66.3	W.N.W	76	2	20	11 A				
19	10	42.6	.4349	68.6	W.N.W	78	1	14	7 A				
20	10	50.	.5261	73.	S.	53	—	—	—				
21	10	49.	.4957	73.3	N.	53	—	—	—				
22	1	49.	.3874	90.3	S.E.	27	—	—	—				
23	0	44.6	.4051	75.	S.	30	—	—	—				
24	0	44.3	.3477	84.6	N.N.E.	32	—	—	—	1-30 P		.83	
25	0	43.3	.2985	93.6	N.	168	$\frac{1}{2}$	10	9 A				
26	0	46.6	.3511	90.	N.N.E.	150	$\frac{1}{4}$	7					
27	10	43.	.3862	77.3	N.W.	12	3	25	7 A				
28	10	40.6	.4297	67.6	S. S. W.	1	1	14	11 A				
29	10	43.3	.4159	72.	N.	64	$2\frac{1}{2}$	22	12 M				
30	1	41.3	.3322	79.6	N.	25	—	—	12 M	4-30 P	12 P		
31	0	49.	.4262	82.6	S.W.	167	10	45	3 P	0 A	5 P	.80	

†Early morning. T=trace.

REMARKS.

The weather for Massachusetts in the month of October was warmer than usual with about the average amount of precipitation. There was plenty of sunshine and in most places no weather cold enough to injure apples or hardy garden vegetables. On the whole, the month has been very favorable for the maturing of late fruits and crops, and for harvesting and fall plowing and seeding. At Boston the mean temperature averaged nearly 3° a day above the normal. The lowest temperature recorded was 38° on the 15th and 16th, and the highest was 76° on the 20th. The precipitation there was .83 inches above the usual amount for the month and was well distributed. At Amherst the mean temperature was above the normal and the rainfall was about an inch above the average for 59 years. On the 16th ice formed, and the ground froze slightly in places. No great damage has been experienced from severe frosts, and generally speaking the weather has been very favorable for farming. At Boston the accumulation of temperature since January 1st is 733° in excess of the usual amount; or in other words, the year so far has averaged nearly 2.5° a day warmer than the normal for 20 years. There is a deficiency of very nearly 9 inches in precipitation at this station since January 1st; and if predictions could be made from averages we might look for considerable cold weather and snow for the next two months. The rainfall is still insufficient for wells and springs, although grass roots and newly seeded fields are having enough moisture for rapid development. The month has been favorable for the grass prospects in 1895.

Eight cyclones and six anticyclones influenced the weather, most of the areas of fair and foul weather being of marked development and moving rapidly. Four of the cyclonic areas passed easterly to the north of New England, one passed across our district from west to east, one moved up the eastern coast, one moved south of us and one crossed New England from south to north. The last named was a West India hurricane, having moved up the Atlantic coast from the Mexican gulf. It gave heavy rainfall and high gales.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 71. NOVEMBER, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading, . . 30.73, 29th, 9 P.
Actual minimum reading, . . 29.51, 3rd, 11 A.
Mean reduced to sea level, ... 30.081
Monthly range, ... 1.22

**Air Temperature.* In Degrees Fahr.

Highest, ... 62.; 65.; 3rd
Lowest, ... 11; 10., 20th
Mean, ... 36.5; 34.8
Monthly Range, ... 61.; .55
Highest mean daily, ... 56.1, 55.5
Lowest mean daily, ... 21.4, 23.5
Mean maximum, ... 41.6; 42.5
Mean minimum, ... 28.1; 27.1
Mean daily range, ... 13.5; 15.4
Greatest daily range, ... 24. ; 25.
Least daily range, ... 4. ; 6.

Humidity.

Mean dew point, ... 27.3
Mean force of vapor, ...2291
Mean relative humidity, ... 70.8

Wind.

Prevailing Directions.

North, ... 20 per cent.
North West, ... 27 " "
South West, ... 23 " "
Other directions, ... 30 " "

Total movement, ... 4179 m.
Greatest daily movement, . . . 306 m., 28th
Least daily movement, ... 19 m.; 13th
Mean daily movement, ... 139 m.
Mean hourly velocity, ... 5.8 m.
Maximum pressure per square foot, 18 lbs.= 60 m. per hour, 3rd, at 9-30 A.

**Precipitation.* In inches.

Total precipitation, ... 1.57; 3.14

Weather.

Mean cloudiness observed, . . . 50 per cent.
Number of clear days, ... 9
Number of fair days, ... 6
Number of cloudy days, ... 15
Total cloudiness recorded by the Sun Thermometer, . . . 165 hours or 56.3 per cent.
Number of days on which .01 inch or more rain or melted snow fell, ... 11

Bright Sunshine.

Number of Hours recorded, ... 128
Rain, . . . 3d, 5th, 9th, 14th, 17th, 19th, 23rd
Snow, . . . 8th, 10th, 24th, 25th, 27th, 30th
Total fall in inches, ... 4¼
Mean Ozone, ... 28 per cent.
Gales, of 35 or more miles per hour, 60, 3rd, W.; 53, 6th, N.; 38, 7th, W.S W.; 51, 19th W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.20	29.79	29.995	56.	58.	4 P	40.	38.	7 A	50.3	40
2	30.33	30.15	30.24	60.	61.	4 P	36.	34.	6 A	51.6	10
3	30.15	29.51	29.83	62.	65.	9 A	50.	46.	12 P	56.1	10
4	29.93	29.72	29.825	52.	54.	12 M	41.	40.	12 P	46.	10
5	29.91	29.51	29.71	44.	44.	1 P	31.	32.	11 P	39.1	10
6	29.89	29.52	29.705	35.	37.	2 P	30.	30.	11 P	33.4	20
7	30.13	29.99	30.06	37.	38.	2 P	25.	24.	6 A	32.1	60
8	30.18	30.13	30.155	31.	32.	1 A	25.	25.	7 A	29.3	60
9	30.14	29.98	30.06	30.	32.	12 M	25.	26.	1 A	27.	10
10	29.98	29.76	29.87	39.	39.	2 P	29.	29.	1 A	34.6	0
11	30.11	29.84	29.975	38.	27.	12 M	27.	20.	10 P	33.9	10
12	30.39	30.11	30.25	33.	35.	2 P	23.	20.	2 A	29.4	60
13	30.40	30.10	30.25	33.	33.	2 P	14.	11.	4 A	27.	40
14	30.10	29.79	29.945	40.	40.	8 P	29.	28.	1 A	35.6	10
15	30.13	29.91	30.02	48.	45.	3 P	31.	29.	8 A	42.4	70
16	29.99	29.89	29.94	56.	59.	3 P	41.	39.	3 A	48.5	50
17	30.15	29.89	30.02	47.	47.	1 A	36.	35.	11 P	44.5	30
18	30.25	30.07	30.16	41.	45.	3 P	25.	23.	7 A	36.7	20
19	30.44	29.90	30.17	43.	44.	12 M	21.	20.	12 P	33.2	20
20	30.63	30.44	30.535	33.	33.	3 P	11.	10.	4 A	24.5	20
21	30.32	30.10	30.21	39.	41.	2 P	25.	28.	1 A	34.3	20
22	30.34	30.11	30.225	48.	53.	2 P	32.	30.	12 P	40.1	20
23	30.35	29.95	30.15	50.	50.	4 P	26.	25.	5 A	39.3	10
24	30.13	29.76	29.945	45.	49.	2 P	31.	37.	7 A	40.5	10
25	30.13	29.71	29.92	39.	41.	11 A	29.	29.	10 P	36.5	10
26	30.30	30.00	30.15	32.	32.	10 P	27.	27.	6 A	29.2	70
27	30.00	29.63	29.815	51.	52.	2 P	29.	30.	7 A	44.7	30
28	30.47	29.72	30.095	38.	40.	0 A	20.	20.	11 P	29.	70
29	30.73	30.47	30.63	26.	29.	2 P	15.	14.	10 P	21.5	20
30	30.70	30.43	30.565	23.	32.	1 P	19.	15.	0 A	21.4	30

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	9	40.	.3321	75.	S.W.	84	$2\frac{3}{4}$	23	1 P				
2	10	44.6	.4237	72.6	S.	60	1	14	9 P				
3	4	52.3	.5287	77.	W.	316	18	60	9-30 A	8 A	12 M	1.28	
4	5	36.3	.3197	65.3	W.	172	3	25	1-30 P				
5	0	36.3	.2423	90.3	N.E.	108	$4\frac{1}{2}$	30	11 P	6 A	11 P	1.02	
6	0	30.	.1825	91.6	N.	355	14	53	10-30 A				
7	7	25.	.1712	80.	W.S.W	188	7	38	2 P				
8	0	25.3	.1574	89.	N.	51	$\frac{1}{2}$	10	6 P	10 A	12 P	.10	3
9	0	28.	.1662	95.	N.	146	$\frac{1}{2}$	10	7 A	7 A	3 P	T.	
10	3	30.3	.2117	78.6	S.	51	$\frac{1}{4}$	8	6 P	†	10-30 A	.35	$\frac{1}{2}$
11	4	28.6	.1980	78.3	S.W.	128	4	28	12 M				
12	7	22.	.1623	74.	S.W.	107	$2\frac{1}{4}$	21	10 A				
13	0	23.3	.1558	82.3	N.W.	19	—	—	—				
14	0	26.6	.2091	70.3	S.S.W.	32	4	28	3 P	0 A	12 M	.06	
15	6	30.3	.2615	65.	S.W.	200	$4\frac{1}{2}$	29	10-30 P				
16	9	37.3	.3616	63.6	S.S.E.	292	$3\frac{1}{2}$	27	4-30 A				
17	0	31.3	.2731	65.6	N.W.	122	$2\frac{1}{4}$	21	11 P	10 A	1 P	.03	
18	9	21.	.1885	63.3	N.	86	—	—	—				
19	2	17.	.1803	56.6	W.	183	13	51	3 P	2 A	7 A	.11	
20	6	4.6	.1322	46.6	S.	133	3	25	6 P				
21	0	32.6	.2140	86.6	N.W.	43	$\frac{1}{4}$	8	9 P	8 A	4 P	.11	
22	9	35.3	.2909	53.6	N.W.	39	2	20	7 P				
23	0	33.3	.2720	74.	N.W.	76	3	25	7 P	6-15 P	7 P	.03	
24	5	29.3	.2429	67.6	S.W.	97	$\frac{1}{4}$	8	12 M	†–A	†–A	T.	T.
25	0	24.3	.1933	68.3	N.	212	$5\frac{1}{2}$	33	11 A	10-30 A	1 P	.01	T.
26	9	16.6	.1581	60.3	N.W.	157	$4\frac{1}{2}$	29	1 A				
27	9	27.3	.2847	54.	S.W.	183	$5\frac{3}{4}$	34	1-30 P	†–A	†–A		T.
28	6	11.6	.1276	61.3	N.W.	306	$10\frac{1}{2}$	46	11 A				
29	9	3.3	.1187	45.6	N.	177	$4\frac{3}{4}$	31	1-30 A				
30	0	15.3	.1211	73.3	N.W.	52	—	—	—	11-45 A	5 P	.04	$\frac{3}{4}$

†Early morning. T=trace.

REMARKS.

The following is furnished by the New England weather Service. Weather for November in Massachusetts. The weather in Massachusetts for the month of November was cold and dry. At Boston the mean temperature was 4.5° a day below the normal. It was above the normal for the first four days with an accumulated excess of 28°. From that date to the end of the month there was a daily deficiency, except on the 16th, 17th, 22d and 23d, with an accumulated deficiency of 135°, or 163° in 26 days. The 29th and 30th were the coldest days of the month with a mean of 22° and 23° respectively. The strong wind on the 29th with the low temperature made it one of the coldest and most disagreeable Thanksgiving days since 1873, when a temperature of 11° was recorded. The low temperature of this month has reduced the accumulated excess for the year to about 600°.

There was a great excess of stormy and cloudy weather, yet at Boston the precipitation was 1.60 inches less than the usual amount for the month. Rain or snow fell to an appreciable amount on 14 days, while a trace came on four other days. The storm of the 5th was the most severe of the month in amount of damage done, and reached the extent of a blizzard in coast districts. The snow and sleet was of the right consistency to hang to whatever object it touched, and trees and telegraph poles suffered unusually.

Eleven cyclones and nine anticyclones influenced the weather, most of them being of marked energy and moving rapidly.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 72. DECEMBER, 1894.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.32, 24th, 4 A.
Actual minimum reading,	29.00, 27th, 12 M.
Mean reduced to sea level,	30.148
Monthly range,	1.22

****Air Temperature.*** In Degrees Fahr.

Highest,	49, 22nd. ; 51 ; 15th
Lowest,	4, 29th ; –4., 30th
Mean,	28.5 ; 26.9
Monthly Range,	45. ; .56
Highest mean daily,	44.2, 42.
Lowest mean daily,	8., 7.
Mean maximum,	35. ; 36.8
Mean minimum,	21.6 ; 17.1
Mean daily range,	13.4 ; 19.7
Greatest daily range,	28. ; 37.
Least daily range,	4. ; 6.5

Humidity.

Mean dew point,	22.3
Mean force of vapor,	.1650
Mean relative humidity,	79

Wind.

Prevailing Directions.

North,	21 per cent.
North West,	15 " "
South,	13 " "
South West,	9 " "
Other directions,	42 " "
Total movement,	3508 m.
Greatest daily movement,	346 m., 13th
Least daily movement,	5 m.; 1st
Mean daily movement,	113 m.
Mean hourly velocity,	4.7 m.

Maximum pressure per square foot, 15 lbs.= 55 m. per hour, 13th, at 9 A.

****Precipitation.*** In inches.

Total precipitation,	3.53

Weather.

Mean cloudiness observed,	44.4 per cent.
Number of clear days,	12
Number of fair days,	6
Number of cloudy days,	13
Total cloudiness recorded by the Sun Thermometer,	124 hours or 43.8 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	11
Number of inches of snow on the ground at the close of the month,	6

Bright Sunshine.

Number of Hours recorded,	159
Rain,	2d, 11th, 12th, 17th, 21st
Snow,	1st, 2d, 8th, 9th, 11th, 24th, 25th26th, 27th
Total fall in inches,	21
Mean Ozone,	26.4 per cent.

Halos.

Solar,	19th, 24th, 26th
Lunar,	10th, 19th

Gales, of 35 or more miles per hour, 41, 3rd, N.W.; 35, 10th, N.E.; 55, 13th, N.N.W.; 41, 17th, N.W.; 37, 18th, N.W.; 36, 23d, N.; 51, 25th, N.W.; 41, 27th, N·N.E.; 35, 29th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.46	30.25	30.323	33.	32.	12 M	24.	21.	1 A	28.2	20
2	30.25	29.89	29.983	34.	32.5	12 P	24.	20.	1 A	28.9	40
3	30.22	29.93	30.183	34.	37.	1 A	23.	21.	12 P	29.2	10
4	30.18	30.04	30.09	34.	32.	3 P	16.	12.	7 A	24.5	10
5	30.22	30.11	30.16	32.	40.	3 P	13.	5.	7 A	23.5	20
6	30.17	30.05	30.097	42.	45.	3 P	20.	8.	8 A	30.5	30
7	30.26	30.17	30.20	39.	47.	3 P	25.	17.	7 A	31.8	40
8	30.22	30.03	30.14	33.	33.	10 A	29.	26.	11 P	32.1	20
9	30.13	30.01	30.05	29.	30.	1 A	25.	23.	7 P	27.2	20
10	30.49	30.13	30.347	33.	32.5	1 P	24.	21.	12 P	27.1	30
11	30.50	30.37	30.447	33.	33.	11 P	23.	20.5	3 A	27.4	20
12	30.37	29.73	29.97	37.	38.	11 P	33.	31.5	1 A	34.6	10
13	29.89	29.67	29.763	43.	45.	11 A	37.	34.	1 A	41.2	20
14	30.02	29.89	29.973	42.	41.5	2 P	35.	32.	6 A	38.7	40
15	30.13	30.02	30.073	48.	51.	2 P	32.	26.	9 A	41.2	30
16	30.19	30.02	30.107	47.	43.	10 P	32.	25.	7 A	40.5	40
17	30.19	29.99	30.073	46.	48.	1 A	39.	36.	12 P	44.2	10
18	30.39	30.19	30.347	37.	41.	1 A	29.	24.	9 P	32.4	40
19	30.33	30.18	30.23	40.	39.	3 P	23.	18.	7 A	31.7	40
20	30.44	30.26	30.343	37.	43.	4 P	22.	18.	8 A	29.2	20
21	30.46	30.09	30.307	42.	45.	4 P	22.	17.	7 A	31.8	30
22	30.28	29.94	30.057	49.	50.	12 M	26.	25.	12 P	39.8	10
23	30.52	30.28	30.44	25.	31.5	1 A	13.	14.	12 P	19.5	50
24	30.53	30.11	30.383	37.	36.	8 P	9.	5.	5 A	21.5	30
25	30.23	29.81	29.913	46.	45.5	1 P	23.	20.	12 P	35.5	10
26	30.50	30.23	30.423	29.	38.	3 P	15.	11.	8 A	22.7	30
27	30.29	29.30	29.717	24.	29.	5 P	10.	6.	12 P	19.4	20
28	30.18	30.07	30.113	15.	27.	3 P	5.	–3.	9 A	9.8	40
29	30.11	29.95	30.01	14.	20.	3 P	4.	–2.	9 A	8.	40
30	30.17	30.06	30.117	27.	27.	3 P	5.	–4.	3 A	16.4	30
31	30.27	30.17	30.22	23.	28.	3 P	9.	1.5	8 A	15.7	20

*First column denotes reading at top of tower, the second at base.

ANNUAL SUMMARY FOR 1894.

PRESSURE.

In Inches.

Actual max. reading,	30.47, Jan. 17th, 10 P.
Actual min. reading,	28.59, Jan. 30th, 6 A.
Mean reduced to sea level,	30.085
Annual range,	1.88

**AIR TEMPERATURE.*

In Degrees Fahr.

Highest,	97.; 98, July 20th
Lowest,	—9.; —17, Feb. 25th
Mean,	49.7; 47.9
Annual range,	106.; 115
Highest mean daily,	82.5; 84, July 28th
Lowest mean daily,	1.; —1.5, Feb. 24th
Mean Maximum,	57.7; 59,6
Mean Minimum,	38.; 36.9
Mean daily range,	16.5; 22.7
Greatest daily range,	35, May 12th; 47.5 Feb. 17
Least daily range,	2.; 5.; Oct. 25th

HUMIDITY.

Mean dew point,	40.5
Mean force of vapor,	.4416
Mean relative humidity,	71.9

WIND.

Prevailing Directions.

South West,	17%
South,	15%
North,	15%
North West,	13%
Total movement,	36257 m.
Greatest daily movement,	443 m., April 13th
Least daily movement,	0 m., Sept. 29th
Mean daily movement,	99.4 m.
Mean hourly velocity,	4.1 m.
Max. pressure per sq. ft., 22½ lbs=67 m. per hour, Feb. 23d at 2 P.	67

PRECIPITATION.

Total rainfall or melted snow,	32.64
Number of days on which .01 inch of rain or melted snow fell,	125
Total snow fall in inches,	71½

WEATHER.

Mean cloudiness observed,	50.5%
Total cloudiness recorded by the Sun Thermometer,	2488 hrs. or 54.9%
Number of clear days,	107
Number of fair days,	83
Number of cloudy days,	175

BRIGHT SUNSHINE.

Number of hours recorded,	2051
Mean Ozone,	24.9%

DATES OF FROSTS.

Last,	May 22nd
First,	August 22nd

DATES OF SNOW.

Last,	April 12th
First,	Nov. 5th

*The first figures denote reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	0	20.3	.1460	77.	S.W.	5	0	—	—	2-30 P	3-45 P		T.
2	0	27.3	.1450	83.3	N.	10	3	21	12 P	5-15 A	6-30 P	.57	5
3	8	23.	.1780	78.7	N.W.	105	8½	41	1 A				
4	8	22.	.1514	84.7	S.S.W.	41	0	—	—				
5	9	19.3	.1405	78.7	S.S.W.	24	1½	17	10 P				
6	9	23.3	.1814	75.	W.	99	2	20	3-30 P				
7	9	23.7	.1778	73.3	W.	13	0	—	—				
8	0	27.7	.1663	93.3	N.	16	0	—	—	†–A	12 P		
9	0	23.7	.1412	92.3	N.	158	2½	22	4 P	0 A	10 P	.53	7
10	0	23.3	.1502	84.3	N.N.W	84	6	35	6 A				3
11	0	26.	.1557	94.3	N.	141	0	—	—	†–A	12 P		
12	0	33.3	.2140	86.3	N.	90	1½	17	10 P	0 A	6 P	1.52	
13	1	28.3	.2501	62.3	W.N.W	346	15	55	9 A				
14	2	31.7	.2285	77.7	N.W.	164	4	28	3 A				
15	9	29.7	.2702	62.3	S.	79	1½	17	8 P				
16	4	30.	.2403	70.	W.	61	1½	17	9 P				
17	9	31.	.2811	62.3	N.W.	184	8½	41	10-30 P	†–A	†–A	.03	
18	9	25.3	.1687	82.3	N.W.	187	7	37	0 A				
19	6	24.7	.1861	75.	S.	95	2	20	3 P				
20	9	24.7	.1792	75.7	N.	5	0	—	—				
21	9	28.3	.2191	75.	S.	82	2½	22	12 P	10-45 P	11-15 P	.05	
22	6	32.	.2544	75.3	N.W.	234	4½	30	3 P				
23	9	12.3	.0996	80.	N.N.E.	241	6½	36	12 M				
24	4	17.	.1372	75.7	S.	91	3	24	8 P	10 P	12 P		
25	4	30.	.1150	81.	N.W.	208	13	51	9 P	0 A	– A	.16	T.
26	6	16.7	.1162	83.7	S.E.	61	2	20	12 P	8-30 P	12 P		
27	1	12.	.0947	88.3	N.N.E.	316	8½	41	7-30 A	0 A	3-30 P	.67	6
28	8	5.7	.0673	88.3	N.W.	85	4	28	10 P		†–A		
29	7	1.3	.0645	79.7	N.W.	170	6	35	2 A				
30	7	11.3	.1021	83.	S.	99	2	20	2 P				
31	6	7.3	.0909	71.	S.S.W.	14	0	—	—				

†Early morning. T=trace.

REMARKS.

The month was slightly cooler and wetter than the average in all eastern sections. In the western part of the state it was cool for the month but there was only about the average rain and snowfall. At Boston it was cooler than usual up to the 11th; from the 11th to 22nd it was quite warm with the 15th, 16th and 17th the warmest days for the month. After the 22nd it was cooler than normal with the coldest day on the 29. The month was not cold enough to make up for the former warmth and at this station the accumulated excess for the year is 581° or 1.6° per day above the normal.

The rainfall at Boston for the month was .82 inches greater than the usual amount; more than half the total amount came in the storm of the 27th. The deficiency for the year at Boston amounts to 9.74 inches. The snow came in full the usual amount over the state and the ground is generally well covered throughout all the cold weather, so that no field crops or roots have been injured to any extent. The springs and wells have not filled up and in eastern towns there is some complaint of nearly dry wells.

The weather was influenced by the passage of eight cyclones and seven anticyclones. The latter were generally wide spread and their influence prevailed. The cyclones were most of them energetic and moved rapidly. That which came up across Massachusetts from the south on the 27th was the most severe. It gave severe gales with heavy snow and rain in the east and heavy snow in the center and west. Considerable damage was done along the coast.

At Amherst the temperature was slightly above normal and the precipitation a little below the average.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No 73. JANUARY, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.31, 10th, 9 A.
Actual minimum reading,	28.87, 26th, 1 P.
Mean reduced to sea level,	30.047
Monthly range,	1.44

*****Air Temperature.*** In Degrees Fahr.

Highest,	46; 455, 7th
Lowest,	4,–4.5, 3rd
Mean,	24.9; 23.2
Monthly Range,	42.; .50
Highest mean daily,	38.4, 37.
Lowest mean daily,	9.9, 9.7
Mean maximum,	31.7; 32.2
Mean minimum,	17.5; 10.9
Mean daily range,	14.2; 21.2
Greatest daily range,	26. ; 37.
Least daily range,	4. ; 6.5

Humidity.

Mean dew point,	19.2
Mean force of vapor,	.1440
Mean relative humidity,	82.5

Wind.

Prevailing Directions.

North,	13 per cent.
North West,	18 " "
South,	18 " "
West,	19 " "
Other directions,	32 " "
Total movement,	2896 m.
Greatest daily movement,	376 m., 27th
Least daily movement,	9 m.; 6th
Mean daily movement,	93.4 m.
Mean hourly velocity,	3 9 m.

Maximum pressure per square foot, 13 lbs.= 51 m. per hour, 27th, at 3 P.

*****Precipitation.*** In inches.

Total precipitation,	3.87

Weather.

Mean cloudiness observed,	51 per cent.
Number of clear days,	11
Number of fair days,	7
Number of cloudy days,	13
Total cloudiness recorded by the Sun Thermometer,	141 hours or 48 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	13
Number of inches of snow on the ground at the close of the month,	6

Bright Sunshine.

Number of Hours recorded,	153

Rain, 6th, 8th, 10th, 11th, 13th, 21st, 22d, 26th

Snow, 4th, 6th, 8th, 10th, 16th, 18th, 19th, 26th, 29th, 30th.

Total fall in inches,	21¾
Hail,	26th
Mean Ozone,	30 per cent.

Halos.

Solar,	5th, 12th, 19th, 24th, 28th
Lunar,	9th

Gales, of 35 or more miles per hour, 37, 4th, N.W.; 45, 13th, S.W.; 35, 14th, S W.; 35, 19th, N.; 37, 24th, W.; 47, 26th, W.; 51, 27th, W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.21	30.04	30.10	25.	26.5	3 P	6.	–1.5	8 A	14.9	40
2	30.32	30.12	30.247	28.	30.	2 P	11.	3.	8 A	19.1	40
3	30.39	30.21	30.313	23.	24.	3 P	4.	–4.5	8 A	14.9	40
4	30.30	30.03	30.117	29.	31.	2 P	13.	12.	12 P	22.8	20
5	30.54	30.30	30.47	14.	24.	3 P	4.	–3.	7 A	9.9	50
6	30.47	30.08	30.167	24.	24.	4 P	13.	9.	4 A	18.5	30
7	30.14	30.05	30.087	46.	45.5	2 P	24.	22.	1 A	38.3	10
8	30.38	30.14	30.283	45.	43.	1 A	35.	31.	5 P	38.4	20
9	30.56	30.38	30.49	38.	37.	2 P	26.	21.	11 P	33.4	20
10	30.61	30.16	30.46	28.	30.	11 P	24.	20.	10 A	26.3	20
11	30.16	29.80	29.85	39.	39.5	5 P	29.	25.5	1 A	35.2	10
12	30.05	29.81	29.94	41.	43.	3 P	29.	23.	9 A	35.5	30
13	29.82	29.52	29.607	44.	43.	12 M	18.	16.	12 P	35.7	10
14	30.06	29.77	29.987	29.	28.	4 P	12.	6.	4 A	20.9	30
15	30.18	30.06	30.117	33.	30.5	3 P	17.	9.	6 P	25.7	20
16	30.12	29.90	29.98	33.	31.5	1 A	26.	25.	12 P	31.2	10
17	30.11	29.91	30.017	34.	34.	2 P	22.	8.	2 A	27.4	30
18	30.20	29.91	30.087	31.	33.	4 P	16.	7.	8 A	24.6	50
19	30.31	29.91	30.13	26.	27.	1 A	15.	5.	12 P	20.9	40
20	30.36	30.21	30.28	31.	36.	3 P	11.	–1.	9 A	20.9	40
21	30.20	29.46	29.87	39.	37.	2 P	19.	11.	5 A	28.5	30
22	29.51	29.33	29.417	42.	40.	1 P	31.	27.	9 P	36.4	10
23	29.72	29.51	29.61	30.	31.	1 A	19.	17.	12 P	26.2	30
24	30.07	29.72	29.877	23.	22.	1 P	15.	10.	8 A	18.8	40
25	30.32	30.07	30.29	29.	26.	2 P	15.	6.	7 A	21.4	50
26	30.21	29.17	29.43	36.	37.	8 P	18.	10.	1 A	29.1	20
27	30.09	29.59	29.89	33.	35.5	1 A	18.	15.	11 P	26.9	40
28	30.22	30.07	30.17	21.	20.	3 P	14.	8.	7 A	17.8	40
29	30.07	29.85	29.92	25.	28.	3 P	13.	8.	6 A	18.1	20
30	30.14	29.97	30.053	27.	24.5	4 P	6.	–2.	10 A	18.	50
31	30.35	30.14	30.30	28.	30.	4 P	10.	–2.	9 A	18.2	40

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	9	8.	.0863	77.	W.	65	2	20	12 M				
2	9	11.	.1028	76.3	N.W.	47	$1\frac{1}{2}$	17	2 P				
3	6	8.3	.0978	72.7	S.	5	0	—	—				
4	7	16.7	.1172	83.3	N.W.	151	7	37	3 P	6-30 A	8-30 A	T.	$\frac{1}{4}$
5	8	7.3	.0722	85.3	N.W.	90	1	14	0 A				
6	0	17.7	.1123	92.3	N.W.	9	0	—	—	†–A	12 P		5
7	0	38.7	.2666	91.	S.	89	$1\frac{1}{2}$	17	12 M	0 A	12 P		
8	0	34.7	.2587	88.7	N.W.	62	0	—	—	0 A	9-30 P	.94	$\frac{1}{2}$
9	0	26.3	.1896	77.2	N.	13	$4\frac{1}{2}$	30	7 P				
10	0	22.3	.1335	91.7	N.	200	$2\frac{1}{2}$	22	2 A	7 A	12 P		
11	0	34.	.3124	92.7	S.	66	1	14	0 A	0 A	6 P	1.01	
12	4	28.7	.2019	79.3	N.E.	33	0	—	—				
13	6	26.3	.2108	73.3	S.W.	157	10	45	6 P	†–A	6-30 A	.32	
14	9	16.7	.1187	84.3	S.W.	172	6	35	0 A				
15	3	21.3	.1437	84.3	S.S.W.	91	$1\frac{1}{2}$	17	3 P		12 P		
16	0	26.3	.1449	91.	N.	36	1	14	2 A	8 A	†–A	.31	$3\frac{1}{2}$
17	9	21.	.1432	87.	N.W.	62	$5\frac{1}{2}$	33	8 P				
18	6	19.	.1274	84.7	W.	59	1	14	2 P	9 P	12 P		
19	8	13.7	.1030	84.3	N.	160	6	35	10 A	0 A	†–A	.21	3
20	9	15.3	.1194	80.	S.	24	0	—	—				
21	2	24.3	.1805	81.	S.S.W.	11	0	—	—	5 P	12 P		
22	1	23.	.1919	81.7	W.	66	4	28	3 P	0 A	–†A	.23	
23	7	12.7	.1201	68.3	W.	188	$5\frac{1}{2}$	33	10-30 A				
24	8	10.	.0906	78.7	W.	199	7	37	1 P				
25	9	15.	.1100	81.3	S.W.	69	1	14	1 P				
26	0	28.	.1727	93.	N.	138	11	47	9 P	†–A	3 P	.82	6
27	9	11.7	.1081	72.	.W	376	13	51	3 P				
28	7	10.7	.0952	79.	W.	181	3	24	3 A				
29	5	14.7	.1091	80.3	N.W.	16	0	—	—	†–A	1 P	.03	$1\frac{1}{2}$
30	3	15.	.1111	83.	S.W.	18	0	—	—	2-30 P	5 P		T.
31	9	16.3	.1135	84.3	N.W.	43	1	14	1 P				

†Early morning. T=trace.

REMARKS.

The following was furnished in part by the New England weather Service.

The weather for the month was influenced by the passage eastward of nine cyclonic and the same number of anticyclonic areas. Of the former five moved to the north of New England, one passed across our district from the west, one passed to the east and south of us and two moved up the eastern coast. The storm which passed to the north of New England on the 26th developed a secondary depression over southern New England, this in turn moving up our eastern coast and causing extremely high winds and considerable loss of life; three men were lost from a fishing schooner near Gloucester and twelve men from three barges that were wrecked near Point Judith, R. I.

The month was generally mild in eastern though colder in central and western districts. At Boston the maximum temperature was 54° on the 7th and the minimum 4° on the 5th, the 5th being the coldest of the month with a mean temperature of only 10°. The warmest day was the 13th with a mean of 43°. The accumulated excess for the month was 107° or nearly 3.5° a day above the normal.

There was an unusually large number of stormy days at this station but the precipitation for the month was nearly half an inch below the normal fall. From one to two feet of snow came during the month and except along the immediate coast the ground has been fairly well covered. The covering has been sufficient to protect all roots from cold, but the partial melting of the snow and the freezing into ice around the roots and in low places has undoubtedly done some injury. There has been no cold severe enough to injure fruit buds or trees. The water supply continues low in many towns.

At Amherst the temperature was about 2° above normal and the precipitation a little above the normal; the coldest day was on the 3d, and the greatest depth of snow fell on the 26th.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 74. FEBRUARY, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.16, 3d, 11 A.
Actual minimum reading,	28.251, 8th, 7 A
Mean reduced to sea level,	29.918
Monthly range,	1.909

****Air Temperature.*** In Degrees Fahr.

Highest,	47, 28th; 45, 17th
Lowest,	-6, -10, 6th
Mean,	22.3; 19.5
Monthly Range,	53.; 55
Highest mean daily,	37.6, 38.5
Lowest mean daily,	1.2; -1.
Mean maximum,	30.7; 31.5
Mean minimum,	13.9; 7.6
Mean daily range,	16.7; 23.9
Greatest daily range,	28. ; 41.
Least daily range,	9. ; 15.

Humidity.

Mean dew point,	17.1
Mean force of vapor,	.1276
Mean relative humidity,	83.9

Wind.

Prevailing Directions.

South West.	11 per cent.
North West,	27 " "
South,	17 " "
West,	12 " "
Other directions,	33 " "
Total movement,	3920 m.
Greatest daily movement,	435 m., 8th
Least daily movement,	3 m.; 28th
Mean daily movement,	140 m.
Mean hourly velocity,	5.8 m.

Maximum pressure per square foot, 25 lbs.= 71 m. per hour, 8th, at 3 P.

****Precipitation.*** In inches.

Total precipitation,	1.05

Weather.

Mean cloudiness observed,	39 per cent.
Number of clear days,	12
Number of fair days,	9
Number of cloudy days,	7
Total cloudiness recorded by the Sun Thermometer,	111 hours or 37 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	5
Number of inches of snow on the ground at the close of the month,	8

Bright Sunshine.

Number of Hours recorded,	187
Snow,	2d, 4th, 7th, 8th, 21st, 25th.
Total fall in inches,	14½
Mean Ozone,	37 per cent.

Halos.

Solar,	3d, 7th, 12th
Lunar,	1st, 3d, 4th, 6th, 8th

Gales, of 35 or more miles per hour, 39, 2nd, N.W.; 35, 4th, N.W.; 49, 5th, N W.; 49, 6th, N.W.; 71, 8th, N.W.; 49, 9th, W.; 37, 21st, W.; 49, 22nd, W.N.W.; 47, 25th, WN.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.42	30.27	30.343	29.	28.	4 P	2.	–7.	7 A	16.9	50
2	30.35	30.07	30.17	30.	29.	3 P	17.	14.	12 P	24.7	30
3	30.44	30.16	30.38	25.	28.	2 P	8.	–2.	6 A	16.1	40
4	30.02	29.76	29.873	27.	27.5	3 P	15.	9.	1 A	20.3	20
5	30.02	29.90	29.977	14.	21.	1 A	–1.	–3.	12 P	6.4	40
6	29.99	29.83	29.89	8.	8.	3 P	–6.	–10.	8 A	1.2	10
7	29.88	29.14	29.64	14.	13.	4 P	1.	–2.	7 A	6.7	40
8	29.24	28.561	29.267	14.	14.	7 A	3.	–3.	1 P	6.7	30
9	29.61	29.31	29.443	17.	17.	7 P	1.	1.	3 A	10.3	30
10	30.06	29.81	29.993	28.	24.	3 P	13.	2.	4 P	20.4	40
11	30.06	29.586	29.805	30.	32.	5 P	16.	10.	8 A	23.1	40
12	29.914	29.82	29.613	36.	35.5	5 P	15.	6.	6 A	24.1	30
13	29.704	29.512	29.604	30.	34.5	3 P	21.	18.	6 A	25.2	20
14	30.162	29.83	29.997	33.	34.	3 P	24.	17.	3 A	27.7	40
15	30.36	30.236	30.295	35.	36.	6 P	26.	18.	1 A	29.4	50
16	30.134	29.85	29.988	39.	42.	3 P	25.	7.	5 A	30.8	30
17	30.09	29.834	29.944	40.	45.	5 P	17.	7.	8 A	28.8	30
18	29.985	29.89	29.925	40.	43.	4 P	17.	8.	7 A	31.	40
19	30.00	29.82	29.897	44.	42.	4 P	23.	15.	7 P	33.4	20
20	29.838	29.764	29.813	34.	37.	3 P	23.	17.	7 A	29.1	40
21	29.60	29.43	29.532	41.	38.	3 P	25.	15.	1 A	32.3	30
22	30.046	29.712	29.852	30.	30.	1 A	15.	10.	12 P	23.1	40
23	30.396	30.11	30.189	24.	26.	1 P	9.	10.	8 A	17.2	30
24	30.51	30.376	30.454	33.	30.	3 P	5.	–7.	8 A	19.8	40
25	30.166	29.89	30.022	44.	44.	3 P	25.	17.	1 A	33.7	30
26	30.254	30.068	30.167	32.	38.	1 A	15.	14.	12 P	23.6	30
27	30.192	29.906	30.005	40.	42.	5 P	7.	–2.	7 A	23.6	50
28	29.676	29.58	29.62	47.	44.	4 P	29.	33.	2 A	37.6	20

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	8	15.	.1066	90.3	S.	6	0	—	—				
2	1	19.3	.1226	90.7	N.W.	87	7½	39	11-30 P	7-30 A	2-30 P	.10	2
3	5	11.7	.0928	83.	W.	85	¾	12	11 A				
4	1	17.	.1133	87.3	N.N.W.	119	6	35	10-30 P	7 A	3-30 P	.01	½
5	10	–1.3	.0533	81.7	N.W.	321	12	49	2 P				
6	10	–0.7	.0480	94.3	W.	302	12	49	12-30 A				
7	2	4.	.0609	90.3	N.	118	5½	33	5-30 P	5 P	12 P		
8	0	2.3	.0540	94.7	N.W.	435	25	71	3 P	0 A	11 A	.93	10
9	1	7.3	.0742	87.	W.	263	12	49	10 A				
10	10	16.	.1138	83.7	N.W.	217	4½	30	6 P				
11	10	15.7	.1140	84.	N.W.	139	2½	22	11 P				
12	8	21.	.1352	87.7	S.	33	1½	17	11 P				
13	7	19.3	.1278	87.	N.	164	5	32	6 A				
14	10	22.3	.1429	84.7	N.W.	169	4½	30	6 A				
15	10	23.	.1464	84.7	N.W.	151	5	32	1-30 A				
16	10	28.	.1472	86.7	S.W.	22	1	14	4 P				
17	10	23.7	.1665	80.3	S.	14	0	—	—				
18	7	20.	.1736	70.	S.W.	12	0	—	—				
19	5	25.3	.1961	74.	S.W.	38	2	20	4-30 P				
20	10	23.7	.1472	88.	N.W.	94	3½	26	2 P				
21	0	29.	.1852	83.3	S.W.	162	7	37	9 P	9 A	9-30 P	.01	2
22	8	16.3	.1061	87.3	W.N.W	281	12	49	10 A				
23	10	14.3	.0959	88.7	N.W.	91	3	24	4 P				
24	11	15.	.1309	79.	S.W.	42	1½	17	2 P				
25	6	23.	.2073	63.7	S.	282	11	47	10 P	10-30 A	12 M		T.
26	8	16.3	.1166	81.7	N.W.	229	5½	33	9 A				
27	9	21.3	.1512	83.	S.	41	4	28	0 A				
28	0	31.	.2451	74.7	S.	83	0	—	—				

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†Early morning. T=trace.

REMARKS.

The mean temperature and precipitation for the month were much below normal, three-fourths of the precipitation falling during the storm of the 8th; the same observations were taken at Blue Hill Observatory showing that the storm wave extended throughout the entire state. The pressure, also, on the above date was the very lowest on record at this station.

The following is furnished by the New England Weather Service:

The month of February has been cold and dry. The coldest spell for the month and in many places the coldest and most disagreeable for years was from the 3d to 10th. The temperature has registered lower than it fell at any time during the cold spell, but there was a strong northerly gale and it was continued cold. At Boston the mean temperature on the 6th was only 4° above zero, being 22° below the normal temperature for this time of year. The snowfall was not excessive but it was badly drifted and railroad trains were delayed throughout the state and practically stalled in some western counties. The ice accumulation in Boston harbor was the greatest for many years, and other harbors along the coast were almost blocked with ice for a number of days.

The precipitation was very light throughout the state and at the Weather Bureau Office, Boston, it was almost 2.50 inches below the normal amount. Water supplies continue low in the interior and northern sections. The snowfall has been slightly below the usual amount, but the ground has been exceptionally well covered and it is probable that no injury has been done roots of grass or grain.

Eight cyclones and five anticlones influenced the weather in Massachusetts. Of the former one passed across our district from the west, one passed across from the south, two moved up the eastern coast, three passed easterly to the north of us and lay over the lakes at the end of the month. The cyclone which came from the Mexican Gulf and passed to the north across eastern Massachusetts on the 7th and 8th, was the most severe for the month. It was very energetic and gave the lowest barometer reading at Boston ever recorded there. It gave sharply rising temperature and heavy rain in the southeastern part of the state on the early morning of the 8th, but snow in all central and western districts. The northeast gale which preceded the storm and the northwest one which followed were both severe and did great damage along the coast. The cold wave that followed it, while it was disagreeable was not especially severe in this section, but it carried the arctic cold far into the southern states, moving the frost and snow line almost to southern Florida.

C. D. WARNER, Meteorologist.

FRANK L. WARREN, Assistant.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 75. MARCH, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.23, 23d, 7 A.
Actual minimum reading,	29.00, 28th, 7 A.
Mean reduced to sea level,	29.998
Monthly range,	1.23

**Air Temperature.* In Degrees Fahr.

Highest,	52; 49, 1st
Lowest,	12,; 5., 6th
Mean,	33; 31.2
Monthly Range,	40.; 44.
Highest mean daily,	45.9; 42.
Lowest mean daily,	19.3; 19.
Mean maximum,	40.; 40.8
Mean minimum,	25.8; 21.5
Mean daily range,	14. ; 19.3
Greatest daily range,	24. ; 28.
Least daily range,	5. ; 8.

Humidity.

Mean dew point,	26.2
Mean force of vapor,	.1856
Mean relative humidity,	80.6

Wind.

Prevailing Directions.

South West,	13 per cent.
North West,	20 " "
North,	17 " "
West,	17 " "
Other directions,	33 " "
Total movement,	4360 m.
Greatest daily movement,	435 m., 18th
Least daily movement,	0 m.; 7th
Mean daily movement,	140 m.
Mean hourly velocity,	5.8 m.

Maximum pressure per square foot, 20 lbs.= 63 m. per hour, 18th, at 3.30 P.

**Precipitation.* In inches.

Total precipitation,	2.71

Weather.

Mean cloudiness observed,	55 per cent.
Number of clear days,	10
Number of fair days,	4
Number of cloudy days,	17
Total cloudiness recorded by the Sun Thermometer,	199 hours or 54 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	13
Number of inches of snow on the ground at the close of the month,	0

Bright Sunshine.

Number of Hours recorded,	172

Rain, 1st, 2d, 7th, 8th, 13th, 14th, 24th, 25th, 28th.

Snow, 2d, 4th, 6th, 12th, 13th, 15th, 16th, 22d, 28th, 30th.

Total fall in inches,	13
Mean Ozone,	30 per cent.
Thunder and Lightning,	25th.

Halos.

Solar,	11th
Lunar,	8th

Gales, of 35 or more miles per hour, 47, 5th, N.W.; 40, 14th, N.W.; 47, 17th, W.; 63, 18th, N.W.; 37, 19th, W.; 35, 21st, N N.W.; 40, 24th, S.; 45, 25th, S.W.; 42, 26th, S.W.; 47, 28th, N.W.; 35, 29th, N. W.; 37, 30th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.81	29.59	29.599	52.	49.	4 P	40.	35.	6 A	45.9	20
2	29.98	29.748	29.838	45.	44.	1 A	27.	22.	12 P	36.	30
3	29.97	29.896	29.932	41.	42.	5 P	21.	18.	6 A	30.9	30
4	30.18	29.70	29.936	33.	33.	2 P	26.	22.	10 A	29.2	20
5	30.366	30.09	30.213	25.	28.	0 A	14.	10.	7 A	19.3	40
6	30.496	30.36	30.435	33.	33.	2 P	12.	5.	7 A	24.2	50
7	30.298	29.99	30.148	41.	41.	4 P	27.	30.	7 A	33.1	30
8	29.812	29.666	29.727	49.	47.	1 P	33.	32.	6 A	40.2	20
9	29.86	29.502	29.637	40.	43.	11 A	30.	24.	9 P	34.6	30
10	30.17	29.99	30.073	45.	42.	3 P	31.	23.	1 A	37.2	30
11	30.30	30.246	30.275	37.	40.	2 P	26.	23.	7 A	31.4	30
12	30.27	30.234	30.253	42.	38.	1 P	27.	23.	8 A	34.4	10
13	30.214	30.034	30.143	41.	36.	1 P	33.	28.	2 A	38.1	20
14	30.28	29.81	30.047	40.	42.	9 A	21.	19.	12 P	33.7	30
15	30.172	30.00	30.101	24.	32.	1 P	19.	10.	1 A	20.	40
16	29.806	29.625	29.752	32.	34.	1 P	21.	18.	1 A	26.4	30
17	29.91	29.78	29.834	34.	35.	4 P	25.	18.	1 A	30.4	30
18	29.764	29.668	29.704	33.	36.	1 A	28.	26.	12 P	30.3	40
19	29.95	29.84	29.879	39.	39.	6 P	27.	21.	1 A	30.2	50
20	29.98	29.93	29.948	40.	42.	4 P	20.	15.	7 A	30.6	50
21	30.11	29.96	30.025	41.	41.	5 P	22.	20.	6 A	32.5	30
22	30.40	30.24	30.306	41.	40.	5 P	28.	20.	1 A	32.5	20
23	30.52	30.50	30.51	50.	49.	4 P	26.	22.	7 A	37.1	30
24	30.433	30.32	30.374	50.	48.	1 P	31.	27.	6 A	40.2	30
25	30.12	29.86	29.947	49.	48.	4 P	35.	22.	9 P	40.4	20
26	29.83	29.80	29.817	45.	45.	2 P	30.	17.	10 P	37.	10
27	29.97	29.81	29.89	40.	46.	6 P	29.	25.	5 A	33.8	30
28	29.834	29.28	29.568	39.	45.	4 P	31.	29.	12 P	35.9	20
29	30.08	30.031	30.054	41.	41.	3 P	28.	18.	6 P	32 5	40
30	30.27	30.04	30.157	38.	39.	5 P	27.	23.	12 P	31.5	30
31	30.274	30.11	30.171	46.	47.	4 P	26.	21.	2 A	34.7	40

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	3	40.6	.3108	83.6	S.S.E.	97	$1\frac{1}{4}$	16	9-30 A	12 M	12-15 P	T.	
2	1	28.3	.1726	92.7	N.W.	62	1	14	3 P	†– A	4-30 P	.53	$1\frac{1}{2}$
3	9	26.	.1686	83.3	N.W.	51	$1\frac{1}{8}$	18	8 P				
4	0	25.3	.1591	91.	N.W.	116	$3\frac{1}{2}$	26	11 P	4 P	10 P	.22	4
5	11	12.	.0992	86.3	N.W.	243	11	47	1 A				
6	2	21.	.1402	90.	S.	46	0	—	—	1-30 P	9-30 P	.20	2
7	0	31.	.2028	88.7	W.S.W.	0	0	—	—	5-30 P	12 P		
8	2	35.	.2622	83.7	S.	16	0	—	—	0 A	8 A	.38	
9	8	26.	.1806	81.	S.W.	138	5	31	2 P				
10	7	26.6	.1908	70.3	W.	123	$3\frac{1}{2}$	26	10 A				
11	7	25.	.1781	77.6	W.	91	$2\frac{1}{2}$	22	1-30 A				
12	0	28.6	.1398	78.6	S.W.	7	0	—	—	†– A	8-30 A	T.	$\frac{1}{2}$
13	0	32.3	.2090	89.3	S.	25	0	—	—	0 A	12 P		
14	9	30.	.1791	89.3	N.N.W.	205	8	40	10 A	0 A	†– A	.75	
15	0	13.6	.1010	84.3	N.N.W.	58	2	20	3 A	11 A	12 P		
16	5	21.3	.1311	89.6	W.	127	4	28	4 P	0 A	†– A	.08	$1\frac{1}{2}$
17	11	24.	.1541	85.3	W.	333	11	47	4 P				
18	9	22.6	.1907	77.6	W.	435	20	63	3-30 P				
19	12	24.3	.1620	82.	W.N.W	239	7	36	9 A				
20	11	23.6	.1649	81.3	N.W.	103	$4\frac{1}{4}$	29	2-30 P				
21	11	25.6	.1622	82.	N.	219	$6\frac{1}{4}$	35	8-30 A				
22	2	26.	.1803	79.6	N.	194	5	31	7 A	8 A	9 A		T.
23	12	27.3	.2103	73.7	N.	18	1	14	9 P				
24	3	30.3	.2601	68.	S.	197	8	40	12 M	3-30 P	5 P	T.	
25	0	34.	.2737	72.	S.W.	142	10	45	5 P	10 A	5 P	.19	
26	1	29.3	.2346	69.7	S.W.	108	9	42	11 A				
27	5	28.3	.1865	86.3	N.N.W.	160	5	31	1 P				
28	4	25.7	.1959	71.3	N.W.	314	11	47	1 P	†–A	†–A	.24	2
29	3	25.7	.1946	73.3	N.W.	220	6	35	0 A				
30	12	26.	.1644	86.	N.	205	7	37	7 A	†–A	†–A	.12	$1\frac{1}{2}$
31	12	18.7	.1969	53.3	W.	68	$2\frac{1}{2}$	22	5 A				

†Early morning. T=trace.

REMARKS.

The weather for the month has been cold and backward. The ground is still in an unsettled condition and there is considerable snow on the mountains and in drifts in sheltered places in the valley. The mean temperature was below normal, also the precipitation which occurred on thirteen days. A thunder storm of small intensity passed over this section the 25th. The first blue birds of the season were seen on the 31st. The following summary is furnished by the N. E. Weather Service:

The weather for the month was influenced by the passage of nine cyclonic and six anticyclonic areas. The former followed a very southerly course in their movement eastward, and were not generally extensive or severe. They gave a small amount of precipitation and their southerly movement caused prevailing westerly and northerly winds and hence a colder month than is usual. The correspondents of this Service report a cold, bleak month with rain and snowfall much below the usual amounts. There is still considerable snow in the woods and in drifts in sheltered places, and the frost is not out of the ground except along the southern coast. There rhubarb is appearing, and some plowing has been done, and peas and potatoes put in. Though the season is considered late, the condition is not unfavorable.

One correspondent in Essex county reports that all small fruits, strawberries especially, have been badly winter-killed, and a few report injury to clover by the freezing of ice water on the fields; but generally the fields and gardens have been well covered with snow all winter, and it is thought the roots are in splendid condition. Fruit has not been injured, except peaches to a small extent during the cold spell of February 6th to 8th.

Most of the snow has melted slowly by the sun and has gone into the ground where it will do much good, but generally ponds and water supplies are all unusually low for the season. The maple sugar season is very late and the prospect not encouraging.

F. L. WARREN, Observer.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 76. APRIL, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.414, 12th, 7 A.
Actual minimum reading,	29.014, 9th, 9 P.
Mean reduced to sea level,	30.119
Monthly range,	1.400

**Air Temperature.* In Degrees Fahr.

Highest,	79; 81, 25th
Lowest,	28,; 25., 4th
Mean,	46.9; 45.6
Monthly Range,	51.; 56.
Highest mean daily,	64.2; 64.
Lowest mean daily,	35.4; 33.
Mean maximum,	56 8; 56.6
Mean minimum,	37.6; 34.6
Mean daily range,	19.2; 22.
Greatest daily range,	38. ; 41.
Least daily range,	7. ; 10.

Humidity.

Mean dew point,	35.8
Mean force of vapor,	.3433
Mean relative humidity,	68.1

Wind.

Prevailing Directions.

South West,	12 per cent.
North West,	14 " "
North,	18 " "
South,	16 " "
Other directions,	40 " "
Total movement,	4098 m.
Greatest daily movement,	320 m., 10th
Least daily movement,	1 m.; 7th
Mean daily movement,	137 m.
Mean hourly velocity,	5.7 m.

Maximum pressure per square foot, 10 lbs.= 45 m. per hour, 22nd, at 5 A.

**Precipitation.* In inches.

Total precipitation,	5.56

Weather.

Mean cloudiness observed,	54 per cent.
Number of clear days,	9
Number of fair days,	8
Number of cloudy days,	13
Total cloudiness recorded by the Sun Thermometer,	234 hours or 58 per cent.
Number of days on which .01 inch or more rain or melted snow fell,	13
Number of inches of snow on the ground at the close of the month,	0

Bright Sunshine.

Number of Hours recorded,	18^{8}

Rain, 1st, 6th, 7th, 8th, 9th, 10th, 13th, 14th, 15th, 22d, 27th, 30th.

Rainbow,	15th, 25th.
Snow,	3d.
Total fall in inches,	½
Mean Ozone,	24 per cent.
Thunder and Lightning,	9th, 25th, 27th.

Halos.

Solar,	24th, 26th.

Gales, of 35 or more miles per hour, 44, 4th, W.N.W.; 40, 10th, N.W.; 36, 12th, S.S.W.; 44, 13th, S.; 36, 16th, N N.E.; 40, 19th, N.; 45, 22nd, S.; 41, 23d, W.N.W.; 37, 24th, S.W.; 36, 25th, S.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.96	29.71	29.813	43.	38.	12 M	32.	28.	2 A	35.4	20
2	29.70	29.60	29.653	46.	44.	3 P	33.	30.	1 A	38.8	20
3	29.79	29.51	29.623	46.	47.	4 P	32.	31.	12 P	37.5	30
4	30.05	29.90	29.95	43.	43.	6 P	28.	25.	4 A	36.	20
5	30.30	30.18	30.227	49.	45.	5 P	29.	26.	6 A	39.	40
6	30.53	30.416	30.463	47.	49.	11 A	28.	29.	5 A	37.2	30
7	30.48	30.32	30.413	46.	45.	1 P	35.	32.	1 A	40.4	30
8	30.18	29.84	30.024	55.	55.	10 P	40.	37.	3 A	45.4	20
9	29.48	29.294	29.381	62.	60.	2 P	51.	39.	12 P	56.	10
10	30.24	29.63	29.908	51.	50.	1 A	31.	32.	12 P	42.4	30
11	30.68	30.52	30.606	51.	47.	6 P	28.	35.	6 A	36.4	40
12	30.704	30.44	30.588	53.	45.	3 P	30.	26.	1 A	42.4	30
13	30.19	30.01	30.077	57.	57.	3 P	44.	39.	4 A	50.7	10
14	29.75	29.65	30.693	51.	53.	1 A	43.	41.	9 P	47.	10
15	29.98	29.68	29.80	50.	52.	2 P	41.	41.	4 A	44.2	30
16	30.26	30.11	30.177	45.	46.	2 P	38.	33.	12 P	42.2	30
17	30.25	30.12	30.167	60.	60.	4 P	32.	35.	5 A	46.4	30
18	30.12	30.09	30.103	58.	61.	1 P	32.	27.	5 A	47.4	40
19	30.06	29.94	29.99	71.	71.	5 P	33.	30.	5 A	53.5	30
20	30.20	30.08	30.043	60.	63.	2 P	40.	34.	5 A	51.1	40
21	30.32	30.18	30.23	70.	67.	6 P	35.	29.	6 A	51.6	20
22	30.098	29.95	30.006	56.	56.	1 P	43.	38.	3 A	49.5	10
23	30.01	29.86	29.927	58.	60.	1 P	40.	39.	6 A	49.	30
24	30.21	29.96	30.06	64.	65.	3 P	37.	31.	6 A	51.5	20
25	30.08	29.99	30.033	79.	81.	4 P	51.	42.	1 A	64.2	20
26	30.27	30.20	30.24	79.	80.	5 P	50.	48.	6 A	64.	30
27	30.36	30.31	30.34	56.	63.	1 A	45.	44.	10 P	49.	30
28	30.45	30.38	30.417	61.	60.	5 P	42.	38.	12 P	50.4	30
29	30.46	30.32	30.37	65.	65.	5 P	35.	29.	5 A	48	10
30	30.32	30.19	30.267	71.	70.	5 P	53.	50.	6 A	59.7	10

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	0	25.3	.1924	71.3	W.	14	0	—	—	10-30 A	7-30 P	.02	
2	0	35.	.2375	77.	N.	14	0	—	—				
3	7	25.3	.2190	68.3	N.	202	$4\frac{1}{2}$	30	2 P	†– A	10 A	.12	$\frac{1}{2}$
4	8	26.3	.2087	72.3	W.	122	$9\frac{1}{2}$	44	4 P				
5	12	25.	.2423	58.7	N.W.	51	$2\frac{1}{2}$	22	3 P				
6	2	31.	.2180	79.3	S.W.	3	0	—	—	11 A	12 P		
7	0	37.	.2611	84.7	N.W.	1	0	—	—	0 A	12 P		
8	0	44.7	.3342	90.	S.S.E.	74	4	28	11 P	0 A	12 P		
9	0	52.3	.4605	84.7	S.W.	198	5	32	4 A	0 A	12 P		
10	9	26.	.2448	63.7	N.W.	320	8	40	1-30 P	0 A	†– A	2.93	
11	13	17.7	.2026	55.3	N.W.	138	3	24	10 A				
12	8	31.7	.2987	64.3	S.	118	$6\frac{1}{2}$	36	1-30 P				
13	0	44.3	.3988	75.3	S.	260	$9\frac{1}{2}$	44	5 P	– A	12 P		
14	0	43.	.2996	92.3	N.W.	100	1	14	11 P	0 A	12 P		
15	0	38.7	.2940	80.7	N.	167	3	24	7 P	0 A	7 P	1.88	
16	0	31.	.2545	68.7	N.N.E.	278	$6\frac{1}{2}$	36	8 A				
17	13	27.7	.3221	54.3	N.	142	5	32	11 A				
18	13	30.7	.3303	58.7	N.	151	4	28	1 P				
19	13	30.	.4215	46.3	N.	160	8	40	12 M				
20	13	37.3	.3414	68.	S.E.	137	2	20	1 P				
21	13	34.7	.3875	57.3	S.	77	5	32	10 P				
22	3	41.7	.3615	74.	S.	268	10	45	5 A	12-30 P	5-30 P	.09	
23	9	31.	.3410	55.3	N.N.W.	181	$8\frac{1}{2}$	41	4 P				
24	13	34.	.3151	50.7	S.	209	7	37	3 P				
25	10	46.7	.6763	48.3	S.W.	183	$6\frac{1}{2}$	36	8 A				
26	13	44.7	.6116	55.7	N.	56	3	24	8 P				
27	0	39.7	.3184	76.7	N.	208	5	32	10 A	†– A	6 P	.30	
28	9	40.7	.4036	65.	E.	172	0	—	—				
29	7	46.3	.5371	67.	S.W.	52	2	20	7 A				
30	0	55.3	.5651	79.3	S.W.	42	3	24	9 A	†– A	11 A	.22	

†Early morning. T=trace.

REMARKS.

The weather for Amherst and vicinity during the month of April has been backward. The lateness of the season was caused largely by the heavy rainfall during the first half of the month and the low temperature which left the ground cold and wet. The mean temperature for the month however was 1° above the normal. But the rainfall was excessive, being two and one-half inches above normal. Nearly five inches of rain fell during the first fifteen days and this with the snow on the hillside caused an unusual overflow of the Connecticut river which did much damage in the valley.

The month's precipitation for Amherst has been the greatest since 1857. The few warm days at the end of the month has caused vegetation to start rapidly.

The following is furnished by the N. E. Weather Service:

The weather for Massachusetts for the month of April, 1895, was influenced by the passage of six cyclones and four anticyclones. Of the former three moved easterly to the north and one to the south of us, while two passed across our district from west to east. Most of the cyclonic and anticyclonic areas were large and energetic, and moved very slowly. The most marked characteristics of the weather was the extremely heavy rainstorm on the 13th—14th, and the thunder showers and rain in an anticyclone during the last week of the month.

At Boston the temperature averaged nearly one degree a day above the normal for April. The highest was 80° on the 25th and the lowest 27° on the 11th. The warmest day was on the 25th when the mean was 17° above the normal for that day. At Somerset the temperature averaged over 2° a day above the normal.

The precipitation at Somerset was 1.65 inches above the normal and at Boston it was only .02 inch above. The precipitation was greater than the normal over all central and western parts of the state and in most sections the amount has been sufficient to thoroughly soak the ground and fill the reservoirs. The heavy rain of the 9th filled the ground pretty well, so that of the 13th and 14th overflowed, filling the rivers and flooding the valleys. The rain in Vermont and New Hampshire on the last named dates was much heavier than in this state and added to the melting snow it gave a volume of water that did much damage in the Merrimac and Connecticut valleys. The spring was considered quite backward, and the overflowing of the meadows and intervales greatly hindered work and left the ground cold and wet.

The rain has served to start grass and winter grain along finely and all fruit buds are showing great promise. Over the drier sections of the state considerable land has been put in readiness for planting but very little seed has been put in yet.

F. L. WARREN, Observer.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 77. MAY, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading, . . 30.25, 1st, 7 A.
Actual minimum reading, . . 29.43, 27th, 2 P.
Mean reduced to sea level, ... 30.097
Monthly range, ...82

*___Air Temperature.___ In Degrees Fahr.

Highest, ... 94; 92, 10th
Lowest, ... 34,; 29.5, 14th
Mean, ... 61.3; 59.7
Monthly Range, ...60; 62.5
Highest mean daily, ... 78.; 74.7
Lowest mean daily, ... 46.2; 44.7
Mean maximum, ... 75.8; 74.2
Mean minimum, ... 50.4; 45.3
Mean daily range, ... 23.4; 28.9
Greatest daily range, ... 38. ; 44.
Least daily range, ... 8. ; 13.

Humidity.

Mean dew point, ... 48.7
Mean force of vapor, ...5848
Mean relative humidity, ... 65.

Wind.

Prevailing Directions.

South West, ... 25 per cent.
South, ... 20 “ “
North West, ... 13 “ “
North, ... 9 “ “
Other directions, ... 33 “ “
Total movement, ... 4071 m.
Greatest daily movement, . . . 238 m., 12th
Least daily movement, ... 21 m.; 29th
Mean daily movement, ... 132 m.
Mean hourly velocity, ... 5.5 m.
Maximum pressure per square foot, 7lbs.= 37 m. per hour, 16th, at 5 P.

*___Precipitation.___ In inches.

Total precipitation, ... 2.07

Weather.

Mean cloudiness observed, . . . 46 per cent.
Number of clear days, ... 9
Number of fair days, ... 10
Number of cloudy days, ... 12
Total cloudiness recorded by the Sun Thermometer, ... 210 hours or 46 per cent.
Number of days on which .01 inch or more rain or melted snow fell, ... 9
Frost, ... 2nd, 14th, 17th

Bright Sunshine.

Number of Hours recorded, ... 243
Rain, 8th, 12th, 14th, 15th, 18th, 20th, 26th, 27th, 28th, 31st.
Thunder and Lightning, . 4th, 8th, 31st.
Mean Ozone, ... 24 per cent.

Halos.

Solar, ... 4th.
Gales, of 35 or more miles per hour, 35, 7th, S.; 35, 11th, S.W.; 37, 16th, N.W.; 35, 25th, S.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.55	30.46	30.497	62.	62.	3 P	42.	39.	12 P	53.4	40
2	30.42	30.26	30.337	75.	73.	5 P	40.	30.	1 A	55.2	30
3	30.26	30.21	30.233	79.	81.	4 P	46.	37.	4 A	64.1	20
4	30.25	30.14	30.207	87.	88.	5 P	55.	58.	12 P	70.9	10
5	30.41	30.36	30.38	68.	74.	2 P	52.	48.	1 A	58.3	0
6	30.36	30.30	30.323	82.	81.	5 P	50.	46.	3 A	63.5	10
7	30.31	30.22	30.257	84.	87.5	4 P	58.	55.	3 A	68.7	10
8	30.18	30.03	30.08	83.	84.	4 P	62.	59.	1 A	70.9	0
9	30.05	29.94	29.99	89.	88.5	5 P	66.	61.	1 A	75.	30
10	30.01	29.97	29.987	94.	92.	5 P	67.	52.	1 A	76.5	20
11	29.90	29.76	29.807	87.	91.	2 P	62.	58.	6 A	75.3	30
12	29.86	29.73	29.773	68.	67.	1 A	45.	44.	12 P	54.1	50
13	30.03	29.88	29.947	55.	63.	6 P	39.	41.	12 P	46.5	40
14	30.18	29.94	30.027	58.	60.	1 P	34.	29.5	5 A	46.2	60
15	29.97	29.88	29.913	58.	58.	5 P	43.	40.	6 A	49.	40
16	30.04	29.93	29.883	61.	60.	6 P	41.	35.	5 A	52.3	40
17	30.14	30.02	30.097	68.	65.	5 P	38.	30.	5 A	53.1	30
18	30.17	30.09	30.133	63.	67.	5 P	46.	41.	11 P	50.2	30
19	30.28	30.13	30.197	65.	65.	5 P	46.	40.	1 A	52.1	20
20	30.19	30.15	30.163	63.	64.	4 P	46.	36.	6 A	55.	40
21	30.27	30.18	30.22	55.	55.	2 P	47.	41.	4 A	50.7	30
22	30.24	30.14	30.177	68.	65.	5 P	44.	40.	6 A	53.6	40
23	30.18	30.16	30.167	75.	76.	4 P	48.	38.	4 A	62.2	30
24	30.29	30.18	30.24	85.	84.	6 P	55.	47.	4 A	70.4	20
25	30.33	30.14	30.20	75.	77.5	4 P	55.	48.	6 A	66.	20
26	30.06	29.81	29.90	82.	79.	5 P	59.	55.	5 A	67.8	10
27	29.78	29.71	29.743	69.	68.	2 P	52.	49.	11 P	61.2	0
28	30.05	29.96	30.00	57.	59.	5 P	49.	46.	4 A	53.5	20
29	30.15	30.03	30.08	87.	84.	6 P	56.	50.	3 A	69 5	20
30	30.09	30.01	30.037	94.	92.	5 P	57.	52.	6 A	74.	10
31	30.02	29.98	30.003	91.	90.5	6 P	64.	59.	6 A	78.	0

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	14	34.	.3832	54.	E.S.E.	232	1½	17	12 M				
2	14	37.7	.4653	54.7	S.W.	74	3	24	8 P				
3	14	52.3	.6440	66.3	S.	124	4	28	4-30 P				
4	7	62.3	.8509	77.	S.W.	75	1	14	2 A				
5	1	50.7	.5057	75.3	S.S.E.	130	½	10	5 P				
6	11	57.	.6608	75.7	S.	105	2	20	5 P				
7	11	56.	.7744	69.3	S.	204	6	35	8 P				
8	4	63.	.7812	77.3	S.W.	163	4	28	4 P	12-30 P	10 P	.21	
9	10	58.3	.9156	59.	N.W.	81	1	14	2 P				
10	14	55.	.9763	49.7	S.W.	33	0	—	—				
11	9	61.	.6952	62.	S.W.	174	6	35	3 P				
12	0	47.3	.3837	88.	S.W.	238	4	28	5 A	7 A	6 P	.65	
13	9	39.3	.3533	70.7	N.W.	208	2	20	2 P				
14	2	43.3	.3369	88.3	N.E.	101	2	20	2 P	6 P	12 P		
15	1	39.	.3442	70.3	N.W.	154	3	24	6 P	0 A	†– A	.12	
16	3	32.7	.3657	53.3	N.W.	160	7	37	5 P				
17	14	35.	.4066	44.7	S.	97	3	24	9 P				
18	6	38.7	.3974	51.7	S.	135	1	14	7 A	7 A	10-30 A	.02	
19	8	42.7	.3834	66.	S.	152	2	20	8 A				
20	8	41.	.4265	62.	W.	117	3½	26	1 P	10 P		T.	
21	1	35.7	.3445	61.	N.W.	90	1½	17	1-30 A				
22	12	36.7	.4223	54.7	N.	91	2	20	5 P				
23	14	42.3	.5880	47.7	N.W.	145	5	32	1 P				
24	14	55.3	.8204	55.	S.W.	159	4	28	12 M				
25	3	48.3	.6666	52.	S.	221	6	35	3 P				
26	5	59.3	.7201	74.3	S.W.	62	2	20	11 P	†– A	11 A	.24	
27	0	67.	.5652	84.	S.	156	3	24	12 M	7 A	7 P	.79	
28	1	43.3	.4202	68.7	W.	198	5	32	12 M	1 P	3 P	.02	
29	15	54.3	.7612	59.7	S.W.	21	0	—	—				
30	13	63.	.8563	70.3	S.	68	0	—	—				
31	5	66.7	.9238	73.	N.W.	103	3	24	1-30 P	7 P	7-30 P	.02	

†Early morning. T=trace.

REMARKS.

The weather for May was characterized by lack of rain and sudden and violent changes in temperature. The mean temperature for the week beginning the 4th was 69.5 degrees which is the highest temperature ever recorded at this station so early in the year. On the 12th a period of cold weather set in, lasting until about the 22nd and reaching the low temperature of 29.5° and 30° on the 14th and 17th days respectively. There were heavy frosts on the last named dates which did some damage to small fruits in this section. The temperature for the last ten days of the month was high and this with the previous warm weather raised the mean to three degrees above normal. Dry weather prevailed during the month, the precipitation being nearly two inches below normal.

The following is furnished by the N. E. Weather Service:

Four cyclones and four anticyclones controlled the weather for our state for the month of May, and these although small in number brought unusual weather changes. The week ending the 12th was reported by many to be the warmest spell of weather experienced so early in the season for many years, if ever before. The crops that were in the ground made great growth, while buds and leaves came out on the trees in a day almost. The arrangement of atmospheric pressure that brought these conditions was as usual in such weather; a large poorly defined high pressure area spreading slowly off the middle Atlantic coast on to the ocean, and considerably lower pressure to the north, but with no well defined storm within the range of observation. The air moved very sluggishly and brought heat and moisture from the south, while the general absence of clouds allowed the heat from the sun to reach the ground and crops freely. The storm of the 12th was the first well defined for the month, and following this was a marked cold-wave in only a slight ridge of high atmospheric pressure. It gave general frosts on the morning of the 14th, though clouds prevented much damage on the 13th. Another storm moved quickly along, passing to the south of New England and up the coast on the 14th and 15th, and was in turn followed by another wave of colder weather and frosts on the 17th. In these frosts considerable damage resulted to grapes, and small fruits, but it is not thought that apple or other large fruits were injured to any marked extent. Cranberry bogs that could not be flowed were badly injured.

Another warm wave at the close of the month makes this May considerable warmer than usual. At Boston the excess in temperature averaged over 4 degrees a day. There was plenty of precipitation in the extreme southeastern districts, but in the center and west it is too dry for the best growth of grass and field and garden crops.

F. L. WARREN, Observer.

PRESS OF CARPENTER & MOREHOUSE, AMHERST, MASS.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 78. JUNE, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.23, 16th, 7 A.
Actual minimum reading,	29.55, 13th, 9 P.
Mean reduced to sea level,	30.172
Monthly range,	.68

**Air Temperature.* In Degrees Fahr.

Highest,	98; 95, 20th
Lowest,	48, 8th; 44, 9th
Mean,	70.5; 69.1
Monthly Range,	50.; 51.
Highest mean daily,	83.4; 80.
Lowest mean daily,	59. ; 57.
Mean maximum,	82.1; 81.3
Mean minimum,	60.7; 56.9
Mean daily range,	21.4; 24.3
Greatest daily range,	41. ; 45.
Least daily range,	4. ; 4.

Humidity.

Mean dew point,	59.6
Mean force of vapor,	.8000
Mean relative humidity,	68.5

Wind.

Prevailing Directions.

South West,	21 per cent.
South,	13 " "
South East,	19 " "
North,	12 " "
Other directions,	35 " "

Total movement,	3050 m.
Greatest daily movement,	201 m., 7th
Least daily movement,	34 m.; 30th
Mean daily movement,	101 m.
Mean hourly velocity,	4 m.
Maximum pressure per square foot,	8lbs.= 40 m. per hour, 6th, at 2 P.

**Precipitation.* In inches.

Total precipitation,	2.76

Weather.

Mean cloudiness observed,	48 per cent.
Number of clear days,	11
Number of fair days,	4
Number of cloudy days,	15
Total cloudiness recorded by the Sun Thermometer,	240 hours or 49 per cent.
Number of days on which .01 inch or more rain fell,	11

Bright Sunshine.

Number of Hours recorded,	246

Rain, 3d, 4th, 5th, 6th, 13th, 21st, 23d, 24th, 25th, 27th, 28th, 29th, 30th.

Rainbow, ... 29th.

Thunder and Lightning, 5th, 13th, 23d, 24th, 25th, 28th, 29th, 30th.

Mean Ozone, ... 21 per cent.

Halos.

Gales, of 35 or more miles per hour, 40, 6th, W.; 35, 7th, E.S.E.; 39, 15th, W.; 37, 29th, S.W.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	OZONE.
1	30.06	29.95	29.996	94.	94.	6 P	69.	65.	6 A	80.1	0
2	30.04	29.95	30.01	94.	95.5	4 P	72.	63.	5 A	83.4	10
3	30.15	30.01	30.666	78.	77.	1 P	59.	55.	11 P	69.1	20
4	30.23	30.20	30.213	62.	62.	3 P	56.	53.	4 A	59.	20
5	30.16	30.01	30.07	72.	75.	6 P	59.	56.	1 A	66.1	10
6	30.16	30.01	30.06	75.	75.	1 P	57.	55.	11 P	65.1	30
7	30.44	30.29	30.35	74.	75.	6 P	53.	50.	3 A	63.1	40
8	30.46	30.33	30.386	76.	77.	3 P	48.	45.	6 A	60.8	30
9	30.37	30.27	30.31	84.	83.	5 P	50.	44.	3 A	66.3	20
10	30.29	30.25	30.27	93.	90.	5 P	52.	45.	5 A	72.8	20
11	30.36	29.25	30.286	87.	88.	4 P	66.	62.	3 A	74.7	0
12	30.30	30.08	30.17	85.	86.	4 P	66.	63.	3 A	73.7	10
13	29.95	29.85	29.89	82.	83.	5 P	68.	65.	3 A	72.7	10
14	29.91	29.87	29.886	83.	84.	6 P	67.	64.	2 P	74.3	10
15	30.34	29.90	30.133	78.	78.	5 P	61.	56.	5 A	67.6	20
16	30.51	30.49	30.563	81.	79.	4 P	57.	51.	5 A	68.2	30
17	30.51	30.32	30.393	93.	85.	5 P	54.	47.	5 A	71.5	30
18	30.27	30.18	30.216	94.	89.	5 P	56.	53.	5 A	73.8	30
19	30.12	30.00	30.053	86.	86.	6 P	59.	53.	5 A	73.2	10
20	30.12	30.01	30.053	98.	95.	5 P	60.	62.	5 A	78.	30
21	30.17	30.02	30.106	81.	83.	1 P	64.	60.	5 A	74.	10
22	30.11	30.10	30.106	81.	78.	6 P	68.	55.	5 A	72.	30
23	30.10	30.07	30.083	85.	84.	4 P	62.	60.	12 P	70.8	20
24	30.06	29.99	30.023	88.	86.	4 P	56.	61.	4 A	71.5	20
25	30.09	30.04	30.07	83.	80.	4 P	63.	60.	5 A	71.2	40
26	30.16	30.02	30.11	81.	80.	3 P	63.	60.	4 A	70.5	30
27	30.15	30.10	30.126	68.	65.	3 P	64.	61.	5 A	65.5	20
28	30.20	30.14	30.163	70.	71.	4 P	61.	61.	5 A	65	20
29	30.28	30.25	30.263	84.	82.	2 P	65.	62.	1 A	71.7	30
30	30.26	30.01	30.15	74.	74.	11 A	66.	62.	4 A	70.3	30

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	12	61.	1.1349	51.6	W.	65	3	25	6 P				
2	15	59.3	1.1593	46.6	W.	137	$5\frac{1}{4}$	33	3-30 P				
3	8	58.	.6687	60.	E.	97	$2\frac{1}{2}$	23	3 P	12-30 P	12 P		
4	0	55.7	.5178	85.6	S.E.	72	0	—	—	0 A	12 P		
5	0	62.7	.6521	88.3	S.W.	101	$2\frac{1}{2}$	23	9 P	0 A	12 P		
6	6	51.3	.6033	64.3	N.W.	190	8	40	2 P	0 A	†– A	1.28	
7	15	47.3	.5831	54.	N.	201	6	35	9-30 P				
8	15	43.7	.6382	50.3	N.	177	$4\frac{3}{4}$	31	10-30 A				
9	15	45.3	.7137	46.	E.S.E.	110	$1\frac{1}{2}$	17	12 M				
10	15	61.	.8555	66.6	S.W.	51	0	—	—				
11	11	63.7	.9478	66.3	S.W.	117	2	20	5 P				
12	12	61.7	.9096	62.	S.W.	152	4	29	6 P				
13	7	63.	.8355	70.3	S.W.	200	5	32	5 P	3 P	3-15 P	.04	
14	14	62.7	.9456	62.	S.W.	156	$4\frac{1}{2}$	30	5 P				
15	15	57.3	.8081	60.6	W.	149	$7\frac{1}{2}$	39	11 A				
16	15	56.7	.7130	67.6	S.E.	91	$1\frac{3}{4}$	19	8 P				
17	15	56.7	.8008	62.6	S.	100	$\frac{1}{2}$	10	3 P				
18	15	61.	.8548	69.	S.W.	68	0	—	—				
19	9	56.	.8213	57.	S.W.	62	$1\frac{1}{2}$	17	6 P				
20	15	62.7	1.0682	59.6	N.	58	$2\frac{1}{2}$	23	1-30 P				
21	4	68.3	.8718	80.	S.E.	53	0	—	—	6-15 P	9-15 P	.07	
22	3	64.3	.7866	77.3	S.W.	119	0	—	—				
23	2	65.3	.8354	76.3	S.E.	71	0	—	—	6 P		T.	
24	3	58.	.8130	67.	W.	60	$2\frac{1}{2}$	23	4-30 P	6 P	8 P	.21	
25	3	65.3	.7627	82.6	E.	54	5	32	7 P	12 M	12-30 P	T.	
26	0	63.7	.8123	74.3	S.E.	100	1	14	3 P				
27	0	60.7	.6433	81.6	S.E.	110	1	14	8 P	11 P	12 P		
28	0	64.	.6396	92.3	N.	36	0	—	—	0 A	3 P	.60	
29	2	67.	.8885	83.3	S.	56	7	37	2 P	3 P	4 P	.26	
30	0	66.3	.7156	89.7	S.	34	2	20	6 P	12-40 P	10 P	.30	

†Early morning. T=trace.

REMARKS.

The weather for June was characterized by higher temperature than usual for this month, the average being about 3 degrees above normal, and by small amount of rain, the precipitation being nearly an inch below normal. Quite heavy rains occurred during the first six days, then commenced a hot, dry spell of weather which lasted until the last week of the month when much rain fell. During the afternoon of the 29th, a thunder storm of extreme intensity passed over this section, the lightning striking in many places and doing considerable damage to buildings.

The following is furnished by the N. E. Weather Service:

The weather for the month of June in Massachusetts was generally slightly warmer than usual and it was drier except in local districts where heavy thunderstorms prevailed. At Boston from a trace to .15 inch of rain fell on each of the first six days, but after the 6th no appreciable amount was recorded at the Weather Bureau office there, until the 25th. Nearly one and one-half inches fell from that date to the end of the month but the total for the month did not equal the normal by 1.58 inches. The deficiency for the six months ending June 30th at this station is 6.98 inches. In more northern districts the thunderstorm on the 28th was heavier and more good was done by the rain. At Groton, 2.74 inches came on that date, while the total for the month there was 4.76 inches. Grass especially has suffered for want of rain, and on old upland fields it has matured so fast that it has been necessary to begin cutting. Part of the injury on these fields, however, was done by the extreme drought of last year. Meadows are better and have been greatly benefitted by the rains of the last of the month.

The temperature at Boston was generally below the normal during the rainy weather, and above when clear anticyclonic weather prevailed. For the month it averaged there slightly less than one degree a day warmer than usual. There were four cyclonic and five anticyclonic areas influencing this state during the month, but the former especially were of indefinite area and slight energy.

F. L. WARREN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 79. JULY, 1895.

MONTHLY SUMMARY.

Pressure. In Inches.

Actual maximum reading,	30.05, 3d, 7 A.
Actual minimum reading,	29.55, 25th, 2 P.
Mean reduced to sea level,	30.031
Monthly range,	.50

**Air Temperature.* In Degrees Fahr.

Highest,	91; 90, 21st
Lowest,	49, 14th; 46, 2d
Mean,	69.2; 67.6
Monthly Range,	42.; 44.
Highest mean daily,	80.4; 78.
Lowest mean daily,	60.3; 59.
Mean maximum,	79.3; 79.2
Mean minimum,	58.7; 55.9
Mean daily range,	20.7; 23.3
Greatest daily range,	32. ; 35.
Least daily range,	3. ; 7.

Humidity.

Mean dew point,	59.3
Mean force of vapor,	.7662
Mean relative humidity,	72.7

Wind.

Prevailing Directions.

South West,	15 per cent.
South,	19 " "
South South West,	10 " "
North,	18 " "
Other directions,	38 " "
Total movement,	2934 m.
Greatest daily movement,	218 m., 30th
Least daily movement,	29 m.; 19th
Mean daily movement,	94 m.
Mean hourly velocity,	3.9 m.
Maximum pressure per square foot,	8lbs.= 40 m. per hour, 13th, at 1.30 P. M.

**Precipitation.* In inches.

Total precipitation,	3.87

Weather.

Mean cloudiness observed,	58.5 per cent.
Number of clear days,	9
Number of fair days,	10
Number of cloudy days,	12
Total cloudiness recorded by the Sun Thermometer,	270 hours or 58.4 per cent.
Number of days on which .01 inch or more rain fell,	10

Bright Sunshine.

Number of Hours recorded,	192

Rain, 4th, 5th, 6th, 9th, 13th, 14th, 16th, 21st, 27th, 28th, 30th.

Hail, ... 13th.

Rainbow, ... 13th.

Thunder and Lightning, 6th, 13th, 21st, 27th, 30th.

Mean Ozone, ... 16 per cent.

Gales, of 35 or more miles per hour, 40, 13th, N.E.; 39, 30th, S.E.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.10	29.99	30.027	74.	76.	3 P	57.	62.	12 P	73.8	20
2	30.24	30.20	30.213	78.	79.5	4 P	53.	46.	4 A	66.	30
3	30.33	30.21	30.26	82.	83.	5 P	51.	46.	5 A	68.4	10
4	30.06	30.01	30.037	70.	72.	5 P	60.	56.	5 A	65.2	10
5	30.10	30.05	30.077	77.	77.	4 P	61.	57.	4 A	68.4	10
6	29.92	29.86	29.897	76.	77.5	12 M	63.	61.	3 A	67.7	20
7	29.93	29.91	29.923	82.	81.	5 P	62.	59.	4 A	70.5	30
8	29.92	29.90	29.913	85.	85.	2 P	68.	65.	3 A	75.8	0
9	29.91	29.83	29.873	85.	87.	2 P	62.	59.	12 P	73.4	10
10	30.16	30.08	30.12	74.	75.	6 P	56.	54.	5 A	64.8	30
11	30.25	30.22	30.237	78.	72.	6 P	52.	46.	5 A	65.1	40
12	30.22	30.17	30.19	81.	80.	5 P	52.	46.	6 A	67.5	30
13	30.10	30.00	30.043	67.	69.	1 P	54.	54.	12 P	60.3	20
14	30.14	30.06	30.087	75.	77.	4 P	49.	46.	5 A	64.5	40
15	30.17	30.08	30.11	79.	79.	3 P	59.	64.	1 A	68.2	10
16	30.03	30.01	30.017	66.	67.	10 A	63..	60.	1 A	63.8	10
17	30.04	29.96	29.99	86.	83.	5 P	61.	59.5	5 A	72.6	0
18	30.08	29.98	30.023	80.	81.	4 P	63.	65.	12 P	72.7	0
19	30.25	30.17	30.207	87.	85.	6 P	55.	50.	5 A	71.1	20
20	30.19	30.09	30.133	87.	86.	4 P	64.	61.	7 A	75.1	10
21	30.07	28.98	30.013	91.	90.	4 P	68.	66.	12 P	80.4	0
22	30.00	29.95	29.96	88.	88.	3 P	66.	65.	4 A	76.2	30
23	30.11	30.06	30.077	84.	81.	6 P	65.	65.	12 P	74.7	10
24	30.14	30.02	30.073	83.	81.5	3 P	57.	51.	5 A	71.4	20
25	29.91	29.82	29.867	84.	83.5	3 P	60.	54.	5 A	72.4	0
26	30.04	29.93	29.977	78.	78.	5 P	60.	54.	5 A	68.7	0
27	30.05	29.84	29.95	77.	78.	2 P	52.	46.	6 A	63.2	0
28	30.00	29.85	29.913	78.	77.	5 P	61.	59.	12 P	68.2	30
29	30.04	29.97	30.003	81.	80.	5 P	53.	49.	5 A	68.7	20
30	29.89	29.84	29.863	75.	77.	12 M	58.	60.	12 P	65.9	10
31	29.90	29.86	29.883	72.	71.	5 P	54.	49.	5 A	62.5	30

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	9	55.3	.6728	68.	N.	136	5½	33	1 P				
2	15	54.3	.6776	69.7	N.	103	5	32	10-30 A				
3	15	52.3	.7510	57.7	N.	60	4	28	1-30 P				
4	0	61.	.6108	88.	N.	40	2	20	12 M	11 A	10 P	.02	
5	2	59.7	.7034	73.3	S.E.	50	3½	26	3 P	11-30 A	12 M	.04	
6	1	63.7	.6530	90.	S.E.	65	2	20	11 A	†– A	5 P	.57	
7	2	64.3	.7928	78.3	S.	59	0	—	—				
8	7	65.7	.9046	73.7	S.	153	3	24	8 P				
9	3	66.3	.9276	76.	S.	148	3	24	10-30 P	6-30 A	3-30 P	.74	
10	15	50.3	.6209	60.	N.	144	3	24	5 P				
11	8	54.	.6218	69.7	S.S.E.	75	0	—	—				
12	15	55.3	.6917	68.	S.S.W.	130	2	20	9 P				
13	1	55.	.4889	88.7	S.W.	131	8	40	2 P	8 A	5-15 P	.52	
14	9	54.3	.6440	69.	N.	110	5	32	1 P	7-15 P		T.	
15	2	60.3	.7569	71.7	S.S.W.	75	1	14	7-30 P				
16	0	60.3	.5952	88.3	S.E.	103	1	14	9-30 A	11 A	2-30 P	.24	
17	7	65.3	.8254	78.3	S.S.W.	62	1½	17	10 P				
18	6	60.7	.7949	71.7	N.W.	118	0	17	5 P				
19	14	59.3	.7886	67.3	S.W.	29	0	—	—				
20	4	66.7	.8918	73.	S.	57	5	—	—				
21	13	69.3	1.0510	68.7	S.W.	49	1½	32	11 P	10-30 P	12 P	.42	
22	11	70.	.9031	79.7	S.W.	52	1	17	3 P				
23	4	59.7	.8154	65.	N.W.	63	½	14	2 P				
24	12	58.	.7779	67.	S.W.	56	½	10	10-30 P				
25	9	59.3	.8195	66.	S.W.	63	5	10	9 P				
26	8	57.7	.6831	70.7	W.	87	2	32	11 A				
27	0	58.7	.6829	76.3	S.	93	3½	26	2 P	2-30 P	12 P		
28	14	55.3	.6902	65.	N.W.	169	5	32	10-30 A	0 A	†– A	1.26	
29	14	58.7	.7570	68.	S.S.W.	93	1½	17	2 P				
30	1	56.7	.5824	81.	S.E.	218	7½	39	1-30 P	12-45 P	3-30 P	.08	
31	6	50.3	.5775	65.3	S.W.	143	4	28	12 M				

†Early morning. T=trace.

REMARKS.

The month of July has been unusual in the general lack of hot summer weather and small amount of sunshine, although the mean temperature has been about normal. The wind has been very variable, not blowing long at a time from any quarter, and so causing frequent changes in temperature. The conditions are undoubtedly due to the want of marked barometric areas or conditions. Eight cyclonic and four anticyclonic areas influenced the weather during the month, but all of them except the last two cyclones were of slight energy and indefinite area. The barometric changes were neither large nor rapid, but frequently the place that would be filled by a comparatively high pressue area at one observation would have a comparatively low pressure covering it at the next. The cyclone of the 27th—28th was energetic and well defined and gave heavy rain, high wind and severe local storms.

The precipitation has been below normal and especially light in southeastern sections, but even there enough has fallen to keep crops growing fast. Partly made hay has been injured to considerable extent by the frequent rains, but pastures have continued unusually green, and the grass of fields is starting up fast after the scythe. The season has been one of the best for forage crops, but the moist weather has given an impetus to fungi; potatoes, grapes, cherries, peaches, etc., have been slightly injured.

F. L. WARREN, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 80. AUGUST, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.00, 22d, 7 A.
Actual minimum reading,	29.49, 18th, 2 P.
Mean reduced to sea level,	30.016
Monthly range,	0.51

**Air Temperature.* In Degrees Fahr.

Highest,	88, 16th ; 90, 24th
Lowest,	50, 21st ; 38, 22d
Mean,	70.4 ; 69.7
Monthly Range,	38. ; 52.
Highest mean daily,	75.8 ; 78.5
Lowest mean daily,	60.4 ; 56.0
Mean maximum,	80.5 ; 81.9
Mean minimum,	61.0 ; 57.5
Mean daily range,	19.4 ; 24.4
Greatest daily range,	27. ; 35.
Least daily range,	7. ; 14.

Humidity.

Mean dew point,	60.4
Mean force of vapor,	.7780
Mean relative humidity,	72.7

Wind.

Prevailing Directions.

South South West,	19 per cent.
South,	19 " "
West,	13 " "
North West,	13 " "
Other directions,	36 " "
Total movement,	3397 m.
Greatest daily movement,	222 m., 7th
Least daily movement,	35 m. ; 15th
Mean daily movement,	110 m.
Mean hourly velocity,	4.6 m.

Maximum pressure per square foot, 5½ lbs.= 34 m. per hour, 18th, 4.30 A.M. ; 21st, 10 A.M.

**Precipitation.* In inches.

Total precipitation,	3.46

Weather.

Mean cloudiness observed,	43.8 per cent.
Number of clear days,	9
Number of fair days,	11
Number of cloudy days,	11
Total cloudiness recorded by the Sun Thermometer,	178 hours or 41.5 per cent.
Number of days on which .01 inch or more rain fell,	7

Bright Sunshine.

Number of Hours recorded,	251

Rain, 1st, 2d, 4th, 7th, 12th, 18th, 20th, 27th, 28th, 31st.

Hail, ...

Rainbow, ...

Thunder and Lightning, 4th, 12th, 18th, 31st.

Solar Halo, ... 11th

Mean Ozone, ... 20 per cent.

Gales, of 35 or more miles per hour, none.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.96	29.89	29.920	67.	69.	3 P	60.	54.	2 A	62.8	20
2	30.06	29.98	30.013	75.	76.	4 P	59.	56.	12 P	65.8	10
3	30.08	29.99	30.033	77.	78.	2 P	52.	45.	5 A	66.5	20
4	29.99	29.94	29.960	79.	81.	2 P	63.	60.	3 A	70.3	10
5	30.06	29.96	29.993	86.	86.	5 P	65.	71.	5 A	73.7	20
6	30.09	30.00	30.053	86.	88.	4 P	60.	56.	5 A	73.3	0
7	29.96	29.86	29.920	82.	82.	6 P	68.	66.	2 A	73.2	10
8	30.11	30.02	30.053	82.	83.	4 P	63.	58.	5 A	73.3	20
9	30.15	30.09	30.113	83.	84.	6 P	63.	56.	4 A	73.3	10
10	30.05	29.94	29.980	87.	84.	6 P	65.	59.	6 A	75.5	0
11	30.00	29.94	29.966	88.	88.	5 P	61.	55.	5 A	74.8	10
12	29.88	29.85	29.863	87.	86.	5 P	63.	61.	7 A	72.9	20
13	29.96	29.94	29.950	85.	84.	5 P	68.	65.	5 A	73.9	30
14	30.11	30.04	30.076	85.	86.	5 P	60.	57.	5 A	72.4	20
15	30.05	30.02	30.033	82.	86.	2 P	61.	56.	6 A	73.5	20
16	30.19	30.05	30.130	88.	88.5	5 P	62.	57.	6 A	74.9	10
17	30.15	29.96	30.006	83.	84.5	3 P	64.	60.	6 A	73.4	20
18	29.80	29.97	29.760	82.	84.	6 P	68.	65.	6 A	73.2	0
19	29.93	29.81	29.85	76.	82.	5 P	60.	54.	12 P	6.66	20
20	30.00	29.99	29.996	70.	71.	12 M	57.	49.	3 A	63.2	30
21	30.19	30.00	30.090	70.	69.	5 P	50.	43.	4 A	60.4	30
22	30.29	30.27	30.280	73.	73.	5 P	47.	38.	5 A	60.4	30
23	30.21	30.11	30.160	81.	84.	3 P	57.	54.	5 A	69.6	30
24	29·97	29.79	29.853	87.	90.	4 P	68.	67.	5 A	75.8	0
25	30.11	29.97	30.043	81.	83.	5 P	64.	61.	12 P	72.0	10
26	30.18	30.13	30.150	80.	85.	2 P	65.	58.	5 A	68.9	10
27	30.11	30.07	30.093	78.	83.	1 P	60.	57.	6 A	69.5	0
28	30.02	29.96	29.986	84.	83.	4 P	63.	68.	6 A	73 9	30
29	30.00	29.90	29.936	82.	87.	3 P	67.	65.	12 P	73 1	40
30	30.24	30.17	30.203	80.	80.	5 P	58.	55.	6 A	68.1	50
31	30.11	29.97	30.016	69.	70.	1 P	61.	56.	6 A	65.2	20

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	SNOW.
1	1	53.	.5639	72.3	W.S.W.	130	3	24	2 P	8-15 P	8-40 P	.01	
2	9	54.6	.6310	70.	W.N.W	100	2	20	3 P	10-45 A	11 A	T.	
3	6	58.	.7040	71.3	S. S. W.	108	5	33	3 P				
4	0	65.6	.8202	79.3	S.	133	1	14	0 A	8 A	8-30 A	.10	
5	10	59.3	.8781	63.	S. S. W.	51	0	—	—				
6	9	64.	.8731	73.7	S.	121	5	33	4 P				
7	4	68.6	.8948	78.7	S.S.E.	222	3	24	5 P	9 A	11-30 A	.30	
8	14	58.	.8000	63.3	N.W.	139	5	33	4 P				
9	10	58.3	.8827	58.7	S.S.E.	93	2	20	2 P				
10	14	61.6	.9593	60.3	N.W.	54	$1\frac{1}{2}$	17	1-30 P				
11	13	65.6	.9045	55.6	S. S. W.	58	$1\frac{1}{4}$	16	5 P	†– A	†– A		
12	10	66.3	.8302	82.6	S. S. W.	78	0	—	—	8-30 P	9-30 P	.39	
13	14	63.6	.9019	68.3	W.	55	$\frac{1}{2}$	10	4-30 P				
14	13	59.	.7861	68.3	N.N.W	56	$\frac{1}{2}$	10	3 P				
15	5	60.6	.8049	69.3	S.W.	35	$\frac{1}{2}$	10	2 P				
16	13	62.	.8463	69.	N.W.	67	0	—	—				
17	3	66.6	.8600	78.	S.	158	$2\frac{1}{2}$	23	2 P				
18	8	65.6	.8133	80.	S.	135	$5\frac{1}{2}$	34	4-30 A	†– A	8-30 A	1.53	
19	7	55.3	.6697	68.	W.	107	$3\frac{1}{2}$	27	2 P				
20	4	53.6	.5711	75.	S. S. W.	47	2	20	5 P	3 P	3-20 P	T.	
21	7	58.	.4983	70.3	N. N. W	152	$5\frac{1}{2}$	34	10 A				
22	13	55.6	.5408	84.3	S.S.E.	86	3	25	9 P				
23	5	63.6	.8421	72.6	S.	217	$4\frac{1}{2}$	30	6 A				
24	5	68.3	.9502	76.0	S.W.	192	4	28	12.45 P				
25	13	58.7	.7777	66.0	N.W.	163	$4\frac{1}{2}$	30	11 P				
26	13	55.3	.6907	76.3	S.W.	78	1	14	4 P				
27	5	60.7	.7809	71.6	S.S.W.	107	$2\frac{1}{4}$	22	2.30 P	7 P	7-30 P	T.	
28	10	66.7	.8436	81.3	W.	131	$4\frac{1}{2}$	30	8.30 P	8-50 P	9-50 P	.44	
29	4	66.3	.8553	78.0	W.	119	$1\frac{1}{2}$	17	12 M				
30	9	58.7	.7115	70.3	W.S.W.	97	$\frac{1}{2}$	10	9 A				
31	0	63.3	.6330	91.3	S.	108	$1\frac{1}{2}$	17	9 30 P	8 A	6-45 P	.69	

†Early morning. T=trace.

REMARKS.

The month of August has presented no features of abnormal interest. There have been no storms of a serious nature, and while the mean temperature has been slightly below the average, the first half of the month has had many warm days. The warm winds that frequently prevailed in the early part of the month, drying the surface soil and threatening worse things, made the invigorating showers of the latter half of the month most welcome. The closing days of the month have been characterized by cool nights which have had a slightly retarding influence on the ripening of the crops.

Fruit crops in general are abundant and doing well.

The tobacco crop, reported the best for years in certain sections, has been harvested in the main.

Corn is making good progress, and ensilage corn will be ready for cutting in the course of a week or so.

LEONARD METCALF, Acting Meteorologist.

CHARLES A. KING, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 81. SEPTEMBER, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading	30.12, 7 A. 15th
Actual minimum reading	29.45, 2 P. 18th
Mean reduced to sea level	30.097
Monthly range	0.67

**Air Temperature.* In Degrees Fahr.

Highest	91; 97, 23d
Lowest	39; 33, 15th
Mean	63.8; 64.1
Monthly Range	52.; 64.
Highest mean daily	77.1, 21st
Lowest mean daily	50.1, 30th
Mean maximum	74.1; 78.4
Mean minimum	54.0; 49.9,
Mean daily range	20.1; 28.5
Greatest daily range	32. 9th; 41. 3d
Least daily range	9, 18th, 29th; 17, 29th

Humidity.

Mean dew point	54.8
Mean force of vapor	.646
Mean relative humidity	73.7

Wind.

Prevailing Directions.

South West	27 per cent.
West	13 " "
North West	13 " "
Other directions	47 " "

Total movement	3444 m.
Greatest daily movement	230 m., 13th
Least daily movement	39 m.; 10th
Mean daily movement	114.8 m.
Mean hourly velocity	4.8 m.
Maximum pressure per square foot	43 lbs.= 93 m. per hour, 11th, 3 P.M.

**Precipitation.* In inches.

Total precipitation	5.04

Weather.

Mean cloudiness observed	42.4 per cent.
Number of clear days	15
Number of fair days	10
Number of cloudy days	5
Total cloudiness recorded by the Sun Thermometer	120 hours or 32.1 per cent.
Number of days on which .01 inch or more rain fell	8

Bright Sunshine.

Number of Hours recorded	254

Rain, 9th, 10th, 11th, 12th, 16th, 18th, 26th, 29th, 30th.

Hail, ... 11th

Thunder and Lightning, 11th, 12th, 26th,

Mean Ozone, ... 20 per cent.

Gales, of 35 or more miles per hour, 93, 11th, N.E.; 39, 13th, N.W.; 35, 14th, N.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							OZONE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.12	30.08	30.103	71.	73.	4 P	56.	53.	12 P	63.1	50
2	30.10	30.06	30.080	70.	72.	5 P	47.	41.	6 A	59.0	40
3	30.13	30.09	30.107	75.	81.	4 P	47.	40.	5 A	62.1	30
4	30.16	30.09	30.123	79.	84.5	4 P	60.	56.	3 A	68.3	30
5	30.18	30.15	30.167	83.	84.	3 P	59.	55.	6 A	70.3	10
6	30.22	30.18	30.197	83.	84.5	3 P	60.	56.	5 A	70.4	10
7	30.23	30.17	30.190	75.	87.	1 P	56.	52.	6 A	66.5	30
8	30.23	30.12	30.170	82.	83.	3 P	57.	53.	12 P	68.7	0
9	30.28	30.18	30.227	82.	83.	3 P	50.	45.	6 A	64.1	30
10	30.32	30.24	30.270	80.	82.	5 P	59.	53.	1 A	67.9	0
11	30.15	29.95	30.050	84.	89.	1 P	70.	64.	1 A	73.5	10
12	29.91	29.79	29.840	80.	84.	3 P	67.	65.	6 A	73.7	30
13	30.08	29.91	29.983	72.	79.	1 A	50.	49.	12 P	60.9	30
14	30.31	30.15	30.210	56.	59.	1 P	44.	40.	12 P	50.6	10
15	30.41	30.33	30.367	63.	65.	5 P	39.	33.	6 A	50.7	20
16	30.18	30.08	30.127	62.	66.	4 P	47.	40.	4 A	54.6	10
17	30.01	29.93	29.967	79.	82.	5 P	51.	48.	6 A	66.2	10
18	29.88	29.73	29.803	59.	67.	4 P	50.	45.	6 A	54.5	10
19	30.17	29.93	30.060	71.	74.	4 P	55.	51.	6 A	61.8	0
20	30.13	30.06	30.107	81.	88.	5 P	55.	51.	5 A	67.3	10
21	30.18	30.13	30.163	90.	95.	2 P	65.	67.	5 A	77.1	0
22	30.21	30.12	30.167	90.	95.	4 P	64.	61.	6 A	76.7	20
23	30.12	30.08	30.100	91.	97.	4 P	63.	60.	6 A	75.8	20
24	30.22	30.18	30.193	70.	78.	5 P	52.	50.	12 P	62.0	30
25	30.24	30.16	30.190	69.	72.	3 P	43.	37.	5 A	57.3	20
26	30.01	29.82	29.903	81.	86.	2 P	61.	59.	4 A	70.4	10
27	30.11	29.98	30.030	67.	72.5	12 M	53.	51.	11 P	61.5	20
28	30.28	30.19	30.227	66.	68.	5 P	43.	38.	6 A	55.2	30
29	30.11	29.86	29.977	59.	61.	3 P	50.	44.	5 A	54.9	30
30	29.96	29.74	29.827	55.	59.	1 P	45.	39.	12 P	50.1	20

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.	TOTAL IN INCHES. SNOW.
1	13	48.7	.557	63.7	N.W.	118	1	14	2.30 P				
2	12	49.0	.492	72.0	S.W.	66	1	14	12 P				
3	13	53.3	.628	69.0	S. S. W.	108	2	20	1-30 P				
4	13	61.3	.732	78.3	S. S. W.	172	3.75	27	4 P				
5	11	62.7	.793	75.7	S. S. W.	114	1	14	11-30 A				
6	11	60.7	.813	66.7	N.W.	68	0.5	10	6 P				
7	7	61.3	.704	78.3	S.S.E.	101	0.5	10	2 P				
8	8	54.7	.713	64.0	S.W.	73	1	14	2 P				
9	12	56.0	.633	80.3	S.W.	88	4	30	8-30 P	8 P	12 P		
10	6	61.7	.750	77.7	W.	39	0 5	10	1 A	0 A	2 A	0.75	
11	6	71.0	.929	84.0	S.	147	43	93	3 P	2-20 P	3-15 P	1.33	
12	4	61.0	.826	68.7	S.W.	133	1.25	16	3 P	0 A	0-50 A	0.15	
13	7	45.3	.486	74.0	N.N.E.	230	7.5	39	10.30 P				
14	5	39.7	.348	73.3	N.N.E.	127	6	35	2 P				
15	12	44.3	.379	79.0	W.	79	1	14	2 P				
16	2	46.3	.452	71.3	S.S.W.	200	4	28	2 P			T.	
17	10	49.0	.697	56.7	W.	167	4	28	2 P				
18	2	51.7	.441	88.0	N.W.	48	1	14	—	7 A	12 M	0.41	
19	7	56.0	.586	81.0	W.	58	1	14	11 A				
20	10	66.7	.773	88.7	S.S.E.	65	0	0	0				
21	11	68.0	1.039	74.0	S.W.	123	3.5	26	12 M				
22	12	63.3	.988	66.3	S.W.	53	0 5	10	2 P				
23	12	61.0	.991	60.7	S.W.	87	4	28	10 P				
24	11	41.0	.535	55.3	N.W.	144	3	25	8 A				
25	11	53.3	.523	83.0	S.	86	1.5	17	4-30 P				
26	4	64.3	.818	77.7	S.W.	188	4.5	30	3 P	2 A	3 A	0.43	
27	9	52.0	.507	78.7	W.N.W	127	4.5	30	9 30 A				
28	6	45.	.447	71.7	S.	92	2	20	7 P				
29	0	50.3	.449	82.7	S.S.E.	139	5	32	10.30 P	4 P	12 P	—	
30	7	42.	.339	80.	N. W.	204	5.5	33	12.30 P	0 A	3 A	1.97	

†Early morning. T=trace.

REMARKS.

The month of September has been an unusual one in many respects and in more than one direction a record maker for this station.

With a smaller range of barometric pressures than has thus far been recorded for September at this station, it has given us the greatest number of hours of sunshine, the maximum and the highest mean daily temperatures, the greatest range and the greatest and least mean daily range of temperatures for September and the worst hurricane on record at this station.

Not only did September make a new record of " highest temperature " for itself, but it also established the maximum temperature for the year recorded here, the thermometers registering 91° and 97° in the ground and observatory shelters respectively on the 23d instant.

The storm of the 11th instant was the most notable feature of the month. With a normal though slightly falling barometer, temperature of 84°, wind from the south-south-east, and a clear sky, suddenly, about three o'clock in the afternoon, there came from the northeast a hurricane accompanied with blinding sheets of rain, bright flashes of lightning, and terrific gusts of wind, reënforced by a steady gale and mass of hail. For nearly twenty minutes the storm fairly raged, but had spent itself at the end of half an hour when the wind ceased and the sun shone brightly.

The gale had left a record of a velocity of 93 miles per hour, a sudden fall of 14° in temperature, from 84° to 70°, and an inch and third of rain, fully an inch and a quarter of which must have fallen in twenty minutes. Several hailstones were found by one observer measuring two inches in length, and one at least one and one-quarter inches in diameter. Many trees were split and broken by the storm, standing corn was blown down, and fruit very generally blown from the trees and vines. Much glass was broken in the plant houses and considerable slate was stripped from the roof of the Massachusetts Agricultural College Chapel.

Other noteworthy features of the month were the extreme heat of the 21st, 22d and 23d instants, (95°, 95°, and 97° in the ground shelter) and the heavy rain of the 29-30th instant.

LEONARD METCALF, Acting Meteorologist.

CHARLES A. KING, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 82. OCTOBER, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.39, 31st
Actual minimum reading,	29.30, 13th
Mean reduced to sea level,	30.082
Monthly range,	1.09

**Air Temperature.* In Degrees Fahr.

Highest,	66, 22d and 28th; 71, 3d
Lowest,	27; 20, 22d
Mean,	47.1
Monthly Range,	39.; 51.
Highest mean daily,	58.1, 13th
Lowest mean daily,	36.8, 31st
Mean maximum,	54.8; 57.9
Mean minimum,	38.8; 33.3
Mean daily range,	15.9; 24.6
Greatest daily range,	28. 11th; 39. 3d
Least daily range,	3, 13th; 8, 13th

Humidity.

Mean dew point,	35.4
Mean force of vapor,	.328
Mean relative humidity,	69.2

Wind.

Prevailing Directions.

West,	19 per cent.
South South West,	16 " "
North West,	13 " "
North North West,	13 " "
Other directions,	39 " "

Total movement,	5029 m.
Greatest daily movement,	448 m., 13th
Least daily movement,	23 m.; 16th
Mean daily movement,	162.2 m.
Mean hourly velocity,	6.8 m.
Maximum pressure per square foot,	14 lbs.= 53 m. per hour, 13th, 7 A.M.

**Precipitation.* In inches.

Total precipitation,	4.58, 4.77

Weather.

Mean cloudiness observed,	42 per cent.
Number of clear days,	11
Number of fair days,	12
Number of cloudy days,	8
Total cloudiness recorded by the Sun Thermometer,	145 hours or 42.4 per cent.
Number of days on which .01 inch or more rain fell,	9

Bright Sunshine.

Number of Hours recorded,	197

Rain, 7th, 8th, 12th, 13th, 14th, 15th, 17th, 19th, 26th, 28th, 31st.

Thunder and Lightning, ... 28th,

Gales, of 35 or more miles per hour, . 46, 1st, N.W.; 42, 11th, S.S.W.; 53, 13th, N.E.; 36, 14th, N.; 52, 17th, W.; 40, 19th, S.S.W.; 42, 22d, S.; 37, 25th, S.W.; 39, 27th, S.S.W.; 49, 28th, S.W.

Snow, ... 20th, a trace

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.						
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.
1	30.35	30.05	30.19	54.	56.	5 P	43.	37.	2 A	47.4
2	30.31	30.19	30.26	66.	70.	3 P	40.	32.	5 A	52.8
3	30.32	30.20	30.243	65.	71.	2 P	39.	32.	7 A	52.5
4	30.29	30.24	30.260	61.	65.	1 P	46.	43.	5 A	52.9
5	30.24	29.94	30.053	61.	66.	2 P	43.	36.	5 A	51.1
6	29.88	29.80	29.840	64.	68.	4 P	43.	37.	2 A	52.4
7	29.78	29.75	29.76	61.	64.	1 P	37.	31.	6 A	51.2
8	29.86	29.68	29.757	56.	58.	1 A	45.	40.	11 P	50.2
9	30.20	30.06	30.117	48.	48.5	1 P	39.	30.5	6 A	42.7
10	30.38	30.30	30.35	51.	53.	5 P	34.	34.	7 A	40.9
11	30.42	30.31	30.38	57.	61.	3 P	29.	23.	7 A	45.7
12	30.10	29.85	29.973	61.	64.	1 P	48.	42.	7 A	55.1
13	29.65	29.58	29.613	60.	62.	11 A	57.	54.	1 A	58.1
14	30.25	29.85	30.017	59.	62.	12 M	41.	37.	12 P	54.2
15	30.24	30.16	30.210	49.	50.	2 P	35.	29.	6 A	41.4
16	30.07	29.86	29.963	44.	45.	12 P	35.	31.	5 A	38.8
17	29.98	29.74	29.843	52.	55.	2 P	45.	40.	1 A	47.8
18	30.23	30.19	30.217	51.	53.	4 P	37.	29.	7 A	44.4
19	29.94	29.79	29.853	64.	67.	3 P	46.	40.	1 A	53.7
20	30.00	29.94	29.967	46.	47.	2 P	38.	30.	10 P	42.2
21	30.28	29.95	30.120	42.	51.	2 P	33.	26.	7 A	37.4
22	30.28	30.08	30.153	54.	52.	3 P	27.	20.	6 A	42.3
23	30.17	30.12	30.143	52.	66.	1 A	37.	34.	12 P	47.7
24	30.27	30.17	30.213	48.	58.	1 P	32.	34.	3 A	40.6
25	29.96	29.73	29.867	59.	60.	1 P	39.	31.	3 A	47.7
26	30.11	30.03	30.06	48.	51.	2 P	34.	28.	7 A	42.6
27	30.00	29.90	29.943	63.	67.	3 P	41.	36.	7 A	53.4
28	30.13	29.83	29.943	66.	64.	11 A	40.	37.	12 P	55.0
29	30.31	30.21	30.25	46.	48.	11 A	38.	31.	5 A	42.1
30	30.57	30.50	30.543	44.	48.	4 P	34.	26.	12 P	38.3
31	30.67	30.13	30.433	46.	44.5	2 P	29.	23.	6 A	36.8

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	NUMBER OF HOURS BRIGHT SUNSHINE.	HUMIDITY.			WIND.					PRECIPITATION.			
		MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
												RAIN.	RAIN.*
1	4	35.	.316	66.	W.	259	10.5	46	1 P				
2	11	40.	.388	70.	S. S. W.	141	3	25	1 P				
3	11	40.7	.409	72.	N.N.W.	110	3.5	26	1 P				
4	6	43.	.410	72.7	N.N.E.	190	2.5	22	11-50 A				
5	11	39.7	.381	70.3	N.	157	3.25	25	11 A				
6	11	40.3	.409	67.3	N.	121	5	32	11 A				
7	3	46.	.416	79.7	S. S. W.	88	0.75	12	4 P	1-30 P	1-50 P	T.	T.
8	0	42.7	.348	80.7	N.W.	137	3.5	26	8 P	7-15 A	1 P	0.35	0.36
9	6	28.3	.250	64.3	N.W.	129	2	20	3 P				
10	11	26.7	.242	63.3	W.	64	2	20	9 A				
11	11	37.3	.361	70.7	S. S. W.	171	9	42	12-45 P				
12	0	55.	.436	100.	N.E	133	3.5	26	11 A	11 A	12 P		
13	0	56.3	.454	100.	N. N. E.	448	14	53	7 A	0 A	12 P	2.59	2.68
14	11	38.7	.379	67.3	N.N.W.	305	6.5	36	12 M	6 A		T.	T.
15	4	34.7	.259	80.7	W.	47	0	0	0	4-30 P	6 P	0.03	0.03
16	0	38.	.249	92.3	W.	23	0	0	0				
17	5	29.7	.319	52.3	N.W.	226	13.75	52	3 P	12-45 A	1-30 A	0.09	0.10
18	10	24.7	.276	50.7	N.N.W.	201	2.75	23	2 A				
19	9	46.7	.434	75.3	S.W.	307	8	40	2 P	8 P		T.	T.
20	8	22.7	.229	58.3	W.N.W	180	5	32	2 P				
21	6	22.	.208	59.3	W.	70	2.5	22	2 P				
22	10	34.3	.323	70.3	S.S.W.	179	9	42	11-30 A				
23	9	28.3	.294	54.3	N. W.	182	1.5	18	10 A				
24	8	25.	.237	60.	S.W.	106	3.5	26	2-30 P				
25	6	31.3	.330	58.7	S.W.	241	6.75	37	4 P				
26	5	29.7	.271	63.7	S.	105	1	14	5 P	11-25 P		T.	T.
27	7	43.7	.398	78.3	S.S.W.	188	7.5	39	6 P				
28	5	35.3	.428	56.	.W	238	12	49	1-30 P	0-15 A	1-30 A	0.52	0.60
29	2	26.0	.249	58.3	W.S.W.	132	1.5	18	1 P				
30	7	24.7	.247	55.7	N.N.W.	85	1.25	16	9 30 A				
31	0	30.0	.225	78.	N.N.E.	66	2.5	22	11-30 P	3-35 P	12 P	1.00	1.00

†Early morning. T=trace.

REMARKS.

The Boston Office of the Weather Bureau reports that:—

"Eight cyclonic and the same number of anti-cyclonic areas controlled the weather for Massachusetts during the month of October. Six of the cyclones passed easterly to the north of us, one passed up our eastern coast well out to sea, and one moved from the Lakes to the south of us and then up the coast. The last named was the most notable of the month, as it gave the heaviest continuous rain in eastern Massachusetts, that we have record of. At Boston the rain began at 1.55 P. M. of the 12th, and ended at 4.30 A. M. of the 14th, the amount of rainfall being 5.64 inches. 4.85 inches fell from 8 P. M, of the 12th to 8 P. M. of the 13th. At Nantucket, Mass., and at Portland, Me., the rainfall was light during the storm. * * * * The following amounts are reported by the Boston Water Works: Chestnut Hill, 7.55 inches; West Medford, 7.42; Ashland, 7.50; Lake Cochituate, 6.95; Cordaville, 7.60; Framingham, 8.49. The fall at Wakefield was 6.60 inches. Considerable damage was done to the streets, and cellars were flooded. All danger from a water famine for the present is past in this part of the State."

At this station, however, the rainfall for the month of October has been about normal. As in the eastern part of the State the storm of the 12th and 13th instants was the worst storm of the month, resulting here in an unusually high record of wind for the month (5029 miles) and a large rainfall, (about 2.6 inches between 11 A. M. of the 12th and midnight of the 13th instant), though nothing like the phenomenal amounts recorded near the coast.

The month has been considerably cooler than usual, the mean daily temperature being about 3° below our average for October, while the highest and lowest mean daily temperatures have also been slightly below the average.

A trace of snow, the first of the season, fell on the 20th instant, and the hills lying to the west of Amherst were capped with snow on the morning of November first.

LEONARD METCALF, Acting Meteorologist.

CHARLES A. KING, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 83. NOVEMBER, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.43, 4th, 28th
Actual minimum reading,	28.98, 20th, 21st
Mean reduced to sea level,	30.187
Monthly range,	1.45

****Air Temperature.*** In Degrees Fahr.

Highest,	69, 8th; 72, 7th and 8th
Lowest,	22; 15, 22d
Mean,	41.1
Monthly Range,	47.; 57.
Highest mean daily,	63.6, 8th
Lowest mean daily,	26.1, 22d
Mean maximum,	47.4; 50.3
Mean minimum,	34.8; 30.9
Mean daily range,	12.6; 19.4
Greatest daily range,	27. 26th; 33. 5th
Least daily range,	4, 2d; 8, 21st

Humidity.

Mean dew point,	34.4
Mean force of vapor,	.274
Mean relative humidity,	80.5

Wind.

Prevailing Directions.

North,	20 per cent.
South	13 " "
North West,	17 " "
North North West,	10 " "
West, North West,	10 " "
Other directions,	30 " "

Total movement,	4156 m.
Greatest daily movement,	402 m., 21st
Least daily movement,	21 m.; 4th
Mean daily movement,	138.5 m
Mean hourly velocity,	5.8 m.
Maximum pressure per square foot,	22 lbs.= 67 m. per hour, 21st, 10 A.M.

****Precipitation.*** In inches.

Total precipitation,	4.49, 5.36

Weather.

Mean cloudiness observed,	61 per cent.
Number of clear days,	5
Number of fair days,	11
Number of cloudy days,	14
Total cloudiness recorded by the Sun Thermometer,	183 hours or 62.3 per cent.
Number of days on which .01 inch or more rain fell,	13

Bright Sunshine.

Number of Hours recorded,	111 or 37.7%

Rain, 1st, 2d, 8th, 9th, 10th, 14th, 15th, 17th, 20th, 21st, 22d, 23d, 24th, 25th, 26th.

Gales, of 35 or more miles per hour, 46, 1st, N.W.; 35, 10th, N.W.; 67, 21st, W.N.W.; 58, 26th, S.W.; 38, 30th, N.

Snow, ... 3 in. 2d; 20th, 21st, a trace.

Solar Halo, ... 22d.

Lunar Halo, ... 1st.

Rainbow, ... 15th.

Very heavy fog, ... 19th evening.

Hail, ... 23d, 25th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.25	29.71	29.997	47.	48.	10 A	38.	34.	12 P	43.7	6
2	30.28	30.20	30.24	38.	37.5	10 A	34.	23.	4 P	35.5	0
3	30.55	30.26	30.42	44.	51.	4 P	31.	29.	7 A	36.6	7
4	30.73	30.55	30.682	50.	53.	2 P	31.	26.	3 A	40.3	10
5	30.68	30.55	30.60	55.	61.	3 P	34.	28.	3 A	44.7	8
6	30.55	30.42	30.47	63.	67.	4 P	42.	38.	7 A	52.2	7
7	30.42	30.18	30.33	66.	72.	3 P	47.	43.	5 A	55.8	6
8	30.18	29.96	30.10	69.	72.	3 P	58.	59.	3 A	63.6	0
9	29.96	29.81	29.877	65.	64.	4 A	50.	50.	12 P	60.0	0
10	30.23	29.77	30.037	50.	55.	1 A	38.	35.	12 P	44.6	0
11	30.44	30.23	30.39	37.	42.	1 A	28.	25.	12 P	34.9	2
12	30.47	30.39	30.42	39.	45.	3 P	25.	23.	5 A	32.0	7
13	30.54	30.41	30.463	41.	47.	3 P	30.	29.	7 A	35.1	6
14	30.55	30.26	30.47	42.	45.	7 P	35.	32.	1 A	39.2	0
15	30.26	29.84	29.01	47.	49.	8 P	42.	40.	1 A	43.8	0
16	30.14	29.89	30.06	49.	52.	3 P	39.	34.	11 P	44.4	9
17	30.14	29.91	30.013	40.	42.	6 P	34.	29.	5 A	37.4	0
18	30.06	29.92	29.983	52.	56.	3 P	39.	34.	2 A	45.5	4
19	30.05	29.70	29.923	49.	53.	3 P	39.	36.	12 P	44.8	3
20	29.70	29.26	29.370	47.	50.	2 P	32.	30.	12 P	40.5	0
21	30.32	29.26	29.887	32.	29.	1 A	26.	21.	7 A	27.1	7
22	30.60	30.32	30.56	29.	29.	3 P	22.	15.	6 A	26.1	0
23	30.58	30.09	30.307	50.	52.	10 P	28.	26.	1 A	35.8	0
24	30.29	30.08	30.183	50.	44.	1 A	37.	33.	12 P	42.7	1
25	30.44	30.16	30.343	36.	39.	10 P	31.	26.5	5 A	33.6	0
26	30.16	29.68	29.86	63.	67.	1 P	36.	35.	1 A	49.8	0
27	30.66	29.97	30.47	42.	44.	10 A	33.	27.	12 P	38.3	6
28	30.71	30.55	30.633	43.	50.	3 P	28.	20.5	7 A	35.4	8
29	30.55	30.10	30.263	44.	49.	3 P	27.	22.	7 A	35.3	8
30	30.42	30.06	30.243	42.	46.	12 M	29.	25.	12 P	34.4	6

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
											TOTAL IN INCHES.	
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	* RAIN.
1	30.3	.241	72.7	N.N.W.	302	10.5	46	12-30 P	0 A	3 A	0.32	0.39
2	27.3	.187	81.0	N.	129	—	—	—	11-50 A	12 P †	.35†	.48†
3	30.3	.215	81.0	N.E	52	—	—	—				
4	32.7	.262	76.7	S. S. E.	21	—	—	—				
5	41.0	.332	81.7	S.	107	0 75	12	4-30 P				
6	46.3	.413	78.7	S.S.E.	49	—	—	—				
7	51.3	.486	83.0	S. S. W.	111	1.	11	5 P				
8	60.7	.660	80.7	S.	240	1.5	18	12 P	12 M	12 P	T.	T.
9	55.3	.537	83.3	W. N. W	150	—	—	—	11 P	12 P		
10	31.0	.251	68.0	N.W.	245	6.0	35	2 A	0 A	3 A	0.26	0.31
11	26.7	.188	78.0	N.	223	3	25	1 A				
12	17.3	.186	63.0	N.W.	82	—	—	—				
13	28.7	.204	80.3	N.	217	1.5	18	2 P				
14	39.3	.254	94.3	N.	149	—	—	—	6 A	12 P		
15	43.0	.299	92.3	N.	162	1.5	18	7 P	0 A	4-30 P	1.72	2.01
16	29.0	.258	64.7	S.W.	179	1	14	12 M				
17	36.0	.220	96.7	W.N.W	36	—	—	—	10 A	8 P	0.33	0.37
18	40.3	.329	78.3	S.S.W.	92	0 5	10	6 P				
19	40.7	.285	90.3	S.W.	53	—	—	—				
20	39.0	.261	93.3	N. W.	75	1	14	11 P	1 P	9 P	0.25	0.31
21	11.0	.128	58.0	W.N.W	402	22	67	10 A	12 M	2 P?	T.	T.
22	16.3	.139	68.3	W.	86	—	—	—	9 P	12 P	T.	T.
23	35.7	.236	94.3	W.	83	2	20	5 P	0 A	12 M	0.05	0.04
24	34.3	.244	82.0	N.N.W.	151	—	—	—	0 A	7-30 A	0.20	0.23
25	32.5	.190	96.7	N N W.	58	—	—	—	[illegible] A [illegible] A	12 P 7 A	0.49	0.59
26	49.5	.372	100.	N.W.	225	17	58	2 P	2 P	12 P	0.52	0.63
27	23.7	.203	65.7	N.W.	192	4.5	30	2 A				
28	28.7	.228	76.3	S.	33	0.5	10	9-30 A				
29	29.0	.212	80.3	S.	60	0.5	10	2 P				
30	25.0	.187	76.7	N.	192	7.0	38	12-30 P				

† Snow 3 inches. T=trace.

REMARKS.

The month of November has been one of marked barometric activity and though the areas of barometric depression have predominated, accompanied by a large percentage of cloudiness (62%), high relative humidity (80.5%) and heavy rainfall (5.36") the mean barometer (30.187") and range of pressure (1.45") have been unusually high for this station.

These fluctuations in the atmospheric pressure have in general been very marked and sudden. Between Oct. 30th, 10 A. M. and Nov. 1st, 3 A. M., 17 hours, the barometer fell .94 of an inch; from 12 P. M. Nov. 21st, to 9 A. M. 22d, 33 hours, it rose 1.34 inches or 1.05 inches from midnight to midnight on the 21st; and .8 of an inch from 7 : 30 P. M. on the 26th to 12 : 30 M. on the 27th, 17 hours.

"There were only six anticyclones spreading near enough to us to influence the weather, while nine cyclones gave us part of their clouds and moisture. Of the latter five passed easterly to the north of us and three moved up our eastern coast. Three of those that passed to the north came from the southwest. and moved with increasing energy up the Mississippi and Ohio valleys to the Lakes drawing in large volumes of warm moisture-laden air from the Southern latitudes, and so aiding in increasing our precipitation and making the temperature for the month average from two to three degrees a day higher than usual. Two of these storms passed by to the north of us at about midnight and were then followed by a sharp cold wave with rising barometer."

The mean temperature (41.1°) for the month has been about two degrees above the normal.

The wind storms have in general been moderate and of short duration. Those accompanying the storms of the 21st and 26th instants,— so serious in the West,—were however more severe, registering velocities of 67 and 58 miles respectively at their maxima.

An unusually heavy fog was observed on the evening of the 19th instant.

LEONARD METCALF, Acting Meteorologist.

CHARLES A. KING, Observer.

JAMES L. BARTLETT, Asst. Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 84. DECEMBER, 1895.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.55, 10 A., 17th
Actual minimum reading,	28.77, 5 A., 31st
Mean reduced to sea level,	30.151
Monthly range,	1.78

**Air Temperature.* In Degrees Fahr.

Highest,	58, 31st; 65, 26th
Lowest,	4, -3, 13th
Mean,	32.0
Monthly Range,	54.; 68.
Highest mean daily,	47.1, 20th
Lowest mean daily,	10.2, 13th
Mean maximum,	38.9; 41.1
Mean minimum,	25.5; 19.8
Mean daily range,	13.4; 21.3
Greatest daily range,	25. 31st; 37. 30th
Least daily range,	2, 5th; 9, 25th

Humidity.

Mean dew point,	23.6
Mean force of vapor,	.193
Mean relative humidity,	75.4

Wind.

Prevailing Directions.

North,	19	per cent.
South	13	" "
North West,	10	" "
South South West,	16	" "
South West,	10	" "
West.	10	" "
Other directions.	22	" "

Total movement,	5506 m.
Greatest daily movement,	454 m., 31st
Least daily movement,	27 m.; 25th
Mean daily movement,	177 6 m.
Mean hourly velocity,	7.4 m.

Maximum pressure per square foot, 24 lbs.= 69 m. per hour, 27th, 4 A.M.

**Precipitation.* In inches.

Total precipitation,	2.09, 3.94
Number of days on which .01 inch or more rain or melted snow fell,	8
Snow total in inches,	8

Weather.

Mean cloudiness observed,	45 per cent.
Total cloudiness recorded by the Sun Thermometer,	114 hours or 40 per cent.
Number of clear days,	7
Number of fair days,	14
Number of cloudy days,	10

Bright Sunshine.

Number of Hours recorded, . . . 169 or 60%

Rain. . . 2d, 21st, 22d, 26th, 27th, 30th, 31st.

Gales, of 35 or more miles per hour, 35, 2d, S.S.W.; 36, 13th, N.; 41, 14th, N.N.E.; 35, 15th, N.N.W.; 35, 16th, N.; 37, 22d, W; 44, 26th, S E.; 69, 27th, W.N.W.; 62, 31st, S.W.

Snow, . . . 8 in. 5th; 7th, 9th, 11th, a trace.

Lunar Halo. . . . . 23d.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.46	30.08	30.303	34.	49.	10 P	23.	15.5	6 A	28.7	1
2	30.08	29.50	29.603	54.	56.	1 P	34.	30.	1 A	46.0	0
3	30.14	29.54	29.903	39.	33.	1 A	24.	18.	12 P	30.0	7
4	30.26	30.14	30.213	29.	31.	4 P	18.	11.	8 A	23.3	9
5	30.22	29.85	29.993	24.	33.	1 A	22.	19.	9 A	22.9	0
6	30.21	29.85	30.050	25.	28.	1 P	22.	14.	9 A	23.5	7
7	30.21	29.91	30.037	34.	38.	7 P	21.	11.5	5 A	27.8	1
8	30.35	29.91	30.187	37.	38.5	12 M	20.	16.	11 P	32.0	6
9	30.35	30.25	30.280	28.	28.5	4 P	18.	12.	6 A	22.2	3
10	30.25	30.03	30.143	24.	25.	4 P	8.	–2.5	9 A	17.4	3
11	30.07	29.88	29.943	23.	25.	2 P	14.	10.	12 P	20.0	7
12	30.36	30.07	30.243	14.	17.	1 A	8.	5.	12 P	11.6	7
13	30.37	30.26	30.320	15.	16.	4 P	4.	–3.	8 A	10.2	7
14	30.25	30.03	30.080	30.	32.	4 P	10.	6.	4 A	20.2	7
15	30.20	30.03	30.083	36.	43.	3 P	17.	9.	7 A	26.9	9
16	30.71	30.20	30.523	33.	39.	3 P	26.	17.5	7 A	29.6	9
17	30.83	30.63	30.743	28.	35.	4 P	12.	2.5	8 A	21.3	8
18	30.63	30.38	30.457	46.	48.	4 P	27.	21.5	9 A	35.6	7
19	30.42	30.37	30.387	50.	52.	5 P	38.	30.	10 A	43.9	7
20	30.52	30.41	30.480	55.	58.	4 P	40.	35.	7 A	47.1	6
21	30.56	30.15	30.427	50.	52.	12 P	34.	29.	7 A	42.3	2
22	30.16	29.95	30.070	54.	47.5	4 A	39.	38.	12 P	46.3	3
23	30.17	29.93	30.067	49.	52.	2 P	38.	31.	4 A	43.8	6
24	30.26	29.94	30.167	48.	48.	1 A	40.	35.	12 P	43.5	7
25	30.28	30.24	30.257	43.	44.	8 P	39.	35.	8 A	41.1	0
26	30.24	29.48	29.990	56.	65.	11 P	42.	38.	2 A	45.4	0
27	30.01	29.31	29.890	57.	42.	2 A	33.	29.	12 P	41.2	9
28	30.14	30.00	30.090	42.	47.	3 P	29.	24.	7 A	35.7	9
29	30.22	30.12	30.177	41.	44.	3 P	29.	23.5	8 A	35.5	9
30	30.22	29.53	30.017	50.	62.	12 P	28.	25.	9 A	32.9	7
31	29.81	29.05	29.563	58.	46.	5 A	33.	29.	10 P	43.1	6

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

	HUMIDITY.			WIND.					PRECIPITATION.			
											TOTAL IN INCHES.	
DAY.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	* RAIN.
1	20.7	.162	71.0	W.	69	—	—	—				
2	45.7	.339	93.7	S.W.	126	6.0	35	1 P	2 A	5 P	0.72	0.98
3	15.3	.135	69.3	W. N. W	256	5.5	33	11 A				
4	11.3	.119	68.7	W.	75	0.75	12	9 P				
5	21.3	.116	100.	N.N.W.	271	4.0	29	5 P	2 A	11 P	0.11	.33†
6	11.3	.117	67.7	W.	217	4.0	29	11-30 A				
7	23.7	.157	84.7	S. S. W.	116	2.25	21	7 P	1-50 P	3 P	T.†	
8	19.0	.163	69.0	N.W.	195	5.0	32	9 A				T.
9	16.3	.118	79.7	N.	106	0.5	10	7 P	11-30 A		T.†	
10	11.0	.101	77.7	N.N.E	28	—	—	—				
11	8.3	.095	72.0	N.	264	5.0	32	6 P	11-30 A		T.†	
12	1.3	.070	68.0	N.	276	4.5	30	0 A				
13	−1.3	.070	64.0	N.	316	6.5	36	8 P				
14	9.0	.111	66.3	N.	340	8.5	41	11 A				
15	16.7	.158	64.0	N.W.	98	6.0	35	6 P				
16	18.7	.159	66.3	N.N.W.	187	6.0	35	10 A				
17	12.0	.127	65.0	S.S.W.	71	—	—	—				
18	34.0	.233	89.0	S.S.W.	184	1.2	15	6 P				
19	41.0	.306	85.0	S.	208	2.0	20	3 A				
20	41.7	.349	86.3	S. S. E.	225	3.5	26	3 P				
21	39.3	.289	86.7	S.E.	44	2.5	22	12 P	8 P	12 P	0.37	0.61
22	35.7	.292	73.0	S.W.	286	7.0	37	10 A	0 A	4 A		
23	36.0	.301	73.0	S.S.W.	121	1.0	14	2 P				
24	28.7	.260	61.3	N.W.	177	2.0	20	11 A				
25	32.3	.258	72.3	S.	27	—	—	—				
26	42.7	.340	82.7	S.	65	10.0	44	12 P	12-30 M	12 P	0.10	0.44
27	21.0	.210	56.0	W. N. W	421	24.	69	4 A	0 A	2 A		
28	25.7	.203	72.0	S.	98	0.75	12	4 P				
29	27.3	.212	73.7	S.S.W.	98	2.0	20	3-30 P				
30	32.2	.181	100.	N.	87	2.0	20	12 P	10 A	12 P	—	—
31	30.3	.230	78.	S.W.	454	19.5	62	5 A	0 A	6 A	0.79	1.58

† Snow 8 inches. T=trace.

REMARKS.

" Eight cyclones and six anticyclones influenced the weather for the month. Three of the cyclones passed easterly to the north of us, two across our district from west to east; two moved up our eastern coast well out to sea, and one passed easterly to the south of us then up the seaboard. The low pressure areas predominated. The two storms that passed up the coast were not severe over the greater part of Massachusetts, but on the Cape very high gales prevailed, and considerable damage was done to vessels outside on the ocean. The storm that passed across New England on the 2d, and the one that passed from the Lakes to the south of us and then up the coast on the 5th-6th gave considerable snow. But the last part of the month has been so unusually warm that the snow has all disappeared, the frost is mostly out of the ground, and one sees everywhere farmers working on their land as in the early fall. The two storms that moved northeasterly down the St. Lawrence valley on the night of the 26th-27th and 30th-31st, respectively, increased rapidly in energy, and gave heavy rains and tremendous winds over our entire district. Fences were wrecked, out-buildings blown over or unroofed, and windows blown in." (J. Warren Smith, Director N. E. Weather Service.)

At Amherst too, the storms of the 27th and 31st instants were notable ones. During the former the wind attained a maximum velocity of 69 miles per hour, while the latter if not quite so intense (62 miles per hour) was more prolonged, and fittingly closed a month of unusually high record of wind 5506 miles) with the maximum daily movement for the year,—454 miles.

The range of barometric activity during the month is also worthy of note, as it gives us a new record for maximum range of barometer for December:—from the very high pressure of 30.55 inches at 10 A. M. on the morning of the 17th instant, to the unusually low pressure of 28.77 inches at 5 A. M. during the storm of the 31st instant, a range of 1.78 inches against 1.725, the highest previous December record.

The mean daily temperature for the month was 32° F., nearly two degrees warmer than the average, and the normal temperature conditions for the month were quite reversed, the mean daily temperature for the first half of it, from the first to the 18th instants, excepting the 2d, being below, while the remainder was considerably above the normal temperature. The marked contrast between these conditions is strikingly illustrated by the facts that on December 18th several inches of snow lay on the ground and ice from eight to ten inches thick was cut from the pond at the Massachusetts Agricultural College, while at the close of the month all traces of snow had disappeared and the ground was soft and muddy.

LEONARD METCALF, Acting Meteorologist.

JAMES L. BARTLETT, Asst. Observer.

METEOROLOGICAL OBSERVATORY
OF THE
Hatch Experiment Station,
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST.

Latitude. 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground. 51 ft. Above sea level. 260 ft.

ANNUAL SUMMARY FOR 1895.

Pressure. In inches.

Actual maximum reading,	30.55, Dec. 17, 10 A
Actual minimum reading,	28.25, Feb. 8th, 7 A
Mean reduced to sea level,	30.076
Annual range,	2.30

****Air Temperature.*** In Degrees Fahr.

Highest,	98°, June 20th; 97°, Sept. 23d
Lowest,	-6, -10, Feb. 6th
Mean,	48.5
Annual range,	104; 107
Highest mean daily,	83.4°, June 2d
Lowest mean daily,	1.2°, Feb. 6th
Mean maximum,	57.7; 58.8
Mean minimum,	39.9; 35.3
Mean daily range,	17.6; 23.4
Greatest daily range,	41°, 45°, June 10th
Least daily range,	2° Dec. 5th; 7° July 16th

Humidity.

Mean dew point,	39.5
Mean force of vapor,	0.431
Mean relative humidity,	74.4

Wind.

Prevailing Directions.

North west,	13%
South,	12%
South west,	14%
North,	10%
West,	9%
Other directions,	45%
Total movement,	46,861 miles
Greatest daily movement,	454, Dec. 31st
Least daily movement,	0 miles, March 7th
Mean daily movement,	128.4 miles
Mean hourly velocity,	5.3 miles

Maximum pressure per square foot, 43 lbs. =93 m. per hour, on Sept. 11th at 3 P. M.

****Precipitation.*** In inches.

Total precipitation, rain or melted snow = 44.46.

Number of days on which .01 inch or more rain or melted snow fell,	119
Total snowfall in inches,	61

Weather.

Mean cloudiness observed,	49%

Total cloudiness recorded by the Sun Thermometer, 2145 hours, or 47%.

Number of clear days,	118
Number of fair days,	110
Number of cloudy days,	137

Bright Sunshine.

Number of hours recorded,	2363 hrs=53%

Dates of Frosts.

Last,	May 17th
First,	Aug. 22d

Dates of Snow.

Last,	April 3d
First,	Oct. 20th

Gales of 50 Miles per Hour.

Jan. 27th, 51 m., W.; Feb. 8th, 71 m., N. W.; March 18th, 63 m., N. W.; Sept. 11th, 93 m. N. E.; Oct. 13th, 53 m., N. E.; Oct. 17th, 52 m. W.; Nov. 21st, 67 m., W.N.W.; Nov. 26th, 58 m., S.W.; Dec. 27th, 69 m., W.N.W Dec. 31st, 62 m., S. W.

Compiled by
LEONARD METCALF, Acting Meteorologist.
JAMES L. BARTLETT, Asst. Observer.

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*The first figures denote readings at top of tower, the second at base.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 85. JANUARY, 1896.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.26, 10 A., 16th
Actual minimum reading,	29.37, 11 A., 3rd
Mean reduced to sea level,	30.196
Monthly range,	0.89

**Air Temperature.* In Degrees Fahr.

Highest,	40, 41, 3rd
Lowest,	-7, –12, 6th
Mean,	23.2
Monthly Range,	47.; 53.
Highest mean daily,	34.5, 25th
Lowest mean daily,	–0.8, 6th
Mean maximum,	27.9; 29.6
Mean minimum,	17.3; 11.9
Mean daily range,	10.6; 17.7
Greatest daily range,	25. 12th; 29. 17th
Least daily range,	2.; 7., 1st

Humidity.

Mean dew point,	14.3
Mean force of vapor,	.130
Mean relative humidity,	73.3

Wind.

Prevailing Directions.

North,	36 per cent.
North North West,	13 " "
North West,	13 " "
West,	13 " "
Other directions,	25 " "

Total movement,	4943 m.
Greatest daily movement,	363m., 4th
Least daily movement,	41 m.; 21st
Mean daily movement,	159 m.
Mean hourly velocity,	6.6 m.

Maximum pressure per square foot, 15 lbs.= 55 m. per hour, 1st, 4-30 P. M.

**Precipitation.* In inches.

Total precipitation,	0.53, 1.07
Number of days on which .01 inch or more rain or melted snow fell,	7
Snow total in inches,	6.5

Weather.

Mean cloudiness observed,	43 per cent.
Total cloudiness recorded by the Sun Thermometer,	137 hours or 47 per cent.
Number of clear days,	13
Number of fair days,	8
Number of cloudy days,	10

Bright Sunshine.

Number of Hours recorded,	157

Rain, 24th, 25th.

Gales, of 35 or more miles per hour, 55, 1st, W.N.W.; 38, 3d, N.W.; 52, 4th, N.W.; 48, 5th, W.N.W.; 36, 6th, N.; 38, 8th, N.; 39, 24th, N.N.E.

Snow, 7th, 9th, 10th, 12th, 19th, 24th; traces 3d, 14th, 25th, 26th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.08	29.81	29.940	32.	32.	3 P	30.	25.	5 A	30.6	8
2	30.23	29 88	30.097	37.	39.	3 P	25.	20.	9 A	32.1	8
3	29.88	29.65	29.730	40.	41.	11 A	26.	22.5	12 P	34.4	4
4	30.17	29.76	30.047	25.	19.	1 A	14.	9.5	11 P	19.1	8
5	30.38	30.17	30.250	14.	14.5	2 P	2.	–1.	12 P	10.7	6
6	30.53	30.38	30.497	6.	6.	3 P	–7.	–12.	6 A	–0.8	8
7	30.53	30.15	30.323	9.	9.	2 P	–1.	–5.5	3 A	5.0	0
8	30.21	30.15	30.163	17.	19.	3 P	3.	–4.5	8 A	11.0	8
9	30.17	30.04	30.070	19.	22.	1 P	14.	7.5	6 A	16.5	0
10	30.18	30.04	30.123	27.	29.	2 P	19.	17.5	1 A	23.2	1
11	30.25	30.18	30.200	28.	33.	1 P	16.	9.	9 A	22.7	8
12	30.18	29.96	30.023	28.	17.5	7 P	3.	–5.	8 A	16.8	4
13	30.13	29.97	30.083	28.	32.	2 P	19.	11.5	3 A	24.7	7
14	30.28	30.11	30.157	27.	33.	3 P	15.	6.	8 A	21.5	6
15	30.50	30.28	30.400	22.	25.	3 P	16.	7.	12 P	19.2	9
16	30.54	30.32	30.430	24.	25.	4 P	7.	–3.5	7 A	16.2	9
17	30.38	30.30	30.330	33.	36.	4 P	14.	7.	9 A	24.0	8
18	30.30	30.14	30.183	34.	38.	4 P	28.	22.	3 A	31.4	6
19	30.35	30.14	30.263	33.	32.	1 A	26.	24.	12 P	30.0	0
20	30.36	30.25	30.310	27.	30.5	3 P	23.	20.	4 A	25.1	0
21	30.25	30.18	30.210	32.	34.	2 P	25.	19.	5 A	28.6	0
22	30.48	30.22	30.373	34.	38.5	2 P	24.	18.5	12 P	29.0	8
23	30.52	30.45	30.493	30.	36.	4 P	14.	7.5	8 A	22.9	9
24	30.46	29.82	29.987	37.	39.	10 P	22.	15.	4 A	31.0	0
25	30.16	29.84	30.040	36.	40.	11 A	33.	30.	10 P	34.5	0
26	30.19	30.09	30.137	37.	36.	3 P	32.	28.	6 A	33.7	0
27	30.09	30.00	30.037	34.	34.	8 A	24.	20.	9 P	30.9	4
28	30.31	30.04	30.173	26.	28.	3 P	19.	17.	12 P	23.4	9
29	30.39	30.28	30.330	25.	28.	4 P	11.	5.	8 A	18.6	7
30	30.36	30.20	30.260	36.	39.	3 P	25.	21.	4 A	29.7	3
31	30.47	30.35	30.427	29.	33.	4 P	16.	10.	8 A	24.3	9

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*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

	HUMIDITY.			WIND.					PRECIPITATION.				
											TOTAL IN INCHES.		
DAY.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	RAIN.*	SNOW.
1	12.7	.156	53.3	W.	289	15.0	55	4-30 P					
2	22.7	.177	71.7	S.S.W.	254	4.5	30	2 P					
3	15.0	.177	52.3	W.	303	7.0	38	2 P	12 M				T.
4	−2.0	.084	49.0	N.W.	363	13.5	52	3-30 P					
5	−7.0	.060	56.7	W.N.W	240	11.5	48	2 P					
6	-15.7	.040	52.7	N.	283	6.5	36	11 A					
7	4.0	.058	95.7	N.	127	2.5	22	1-30 A	12 M	12 P M	0.12	0.14	1.25
8	0.3	.072	67.7	N.	212	7.25	38	10-30 A					
9	13.7	.091	92.0	N.	86	4.0	28	12 P	12-30 M	12 P M	0.11	0.17	3.5
10	20.0	.132	84.3	N.	278	5.0	32	10 A	0 A	3 P	0.01	0.01	
11	13.0	.108	79.0	N.	135	1.5	17	0-30 A					
12	16.3	.111	92.3	S. S. E.	43	0.5	10	1 P	2 P	6 P	0.03	0.03	0.3
13	13.7	.138	61.3	W.	107	1.0	14	1 P					
14	12.3	.111	74.7	W.	102	3.5	26	2-30 P	3 P				T.
15	7.3	.099	64.7	N.W.	165	4.0	28	10 A					
16	10.0	.096	79.0	S. S. W.	120	3.5	26	8 P					
17	20.3	.136	86.3	E.N.E	63	0	0	—					
18	24.3	.173	78.3	N.N.W.	133	1.0	14	4 A					
19	25.8	.160	89.0	N.	66	0.5	10	8 P	10 A	6 P	0.03	0.06	0.5
20	19.0	.138	76.3	N.	220	4.5	30	8 A					
21	23.0	.164	77.0	S.W.	41	0	0	—					
22	22.7	.158	80.7	N.N.W.	59	0	0	—					
23	17.0	.124	82.3	N.	64	0	0	—					
24	30.3	.196	87.0	N.	269	7.5	39	2 P	9 A	9-30 P	0.20	0.61	1.0
25	31.0	.190	93.3	N.	205	2.0	20	9 A	11-15 A	3 P	0.03	0.05	T.
26	28.7	.196	81.7	N.W.	66	0.5	10	11 P	10 A	12 M			T.
27	17.3	.155	64.3	W.N.W	204	3.5	26	11 P					
28	6.0	.115	53.7	N.W.	190	4.0	28	1 P					
29	9.0	.117	61.3	W.N.W	44	0.0	0	—					
30	21.7	.167	73.3	N.N.W.	94	1.25	16	5 P					
31	9.7	.126	60.7	N.N.W.	118	2.5	23	1 P					

*First column denotes reading at top of tower, the second at base. T=trace.

REMARKS.

The past month has been an unusally pleasant one for this season of the year.

The atmospheric pressure has been quite constant and very high, the range of pressure being exceedingly small.

"The storms, travelling generally to the north of us, moved slowly during the latter part of the month, while the earlier ones moved with greater rapidity and were followed more quickly by cold waves. The most notable of these that of the 5th.—7th. insts. in New England developed in the Northwest on the 1st.inst.and spread generally and uniformly over the entire country, as predicted by the Weather Bureau twenty hours before its arrival. As the ground was entirely bare during this cold wave it is thought considerable injury has resulted to grass and grain roots and to the roots of fruit trees, although not so much as would have been caused had it occurred later in the season." (Abstracted from J. Warren Smith's January report.,—N. E. Weather Bureau.

The mean temperature has been about four degrees below the normal. The first three days of the month were very warm. the 4th. –18th. insts. decidedly below the normal, while from that time to the end of the month the temperature, with a few minor exceptions has been above the normal. The 6th. inst. with its minimum temperature of twelve degrees below zero (—12°) and mean temperature eight-tenths of a degree below zero (—0.8°) is worthy of special note.

The precipitation has been exceedingly small, but 1.07 inches of water, and while the meadows and hills have been covered with snow since the 9th. inst. there have been but five days of sleighing during the month.

LEONARD METCALF, Acting Meteorologist.

JAMES L. BARTLETT, Asst. Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 86. FEBRUARY, 1896.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.24, 12 M., 17th
Actual minimum reading,	28.50, 11-30 P., 6th
Mean reduced to sea level,	29.891
Monthly range,	1.74

*****Air Temperature.*** In Degrees Fahr.

Highest,	53, 53, 29th
Lowest,	-9, -14, 17th
Mean,	26.6
Monthly Range,	62.; 67.
Highest mean daily,	48.2, 29th
Lowest mean daily,	-1.7, 17th
Mean maximum,	32.5; 34.3
Mean minimum,	20.1; 15.7
Mean daily range,	12.5; 18.7
Greatest daily range,	34., 39., 16th
Least daily range,	3.,21st; 7.,9th

Humidity.

Mean dew point,	22.0
Mean force of vapor,	.157
Mean relative humidity,	87.5

Wind.

Prevailing Directions.

North,	14 per cent.
North North West,	10 " "
North West,	14 " "
West,	10 " "
West North West,	14 " "
West South West,	10 " "
South West,	10 " "
Other directions,	18 " "

Total movement,	6445 m.
Greatest daily movement,	427 m., 7th
Least daily movement,	14 m.; 1st
Mean daily movement,	222.2 m.
Mean hourly velocity,	9.3 m.
Maximum pressure per square foot,	24.5 lbs. =70 m. per hour, 19th, 10 P. M.

*****Precipitation.*** In inches.

Total precipitation,	4.67
Number of days on which .01 inch or more rain or melted snow fell,	11
Snow total in inches,	15.5

Weather.

Mean cloudiness observed,	63 per cent.
Total cloudiness recorded by the Sun Thermometer,	139 hours or 46 per cent.
Number of clear days,	8
Number of fair days,	12
Number of cloudy days,	9

Bright Sunshine.

Number of Hours recorded,	168 or 54 %

Rain, ... 6th, 7th, 13th, 23d, 29th.

Gales, of 35 or more miles per hour, 50, 2d, W.N.W.; 36, 3d, W.N.W.; 61, 6th, N.E.; 58, 7th, W.N.W.; 47, 8th, W.; 41,10th, W.; 68,11th, W.N.W.; 48,12th, W.N.W.; 54,14th, W.; 41.16th, N.W.; 35,17th, W.N.W.; 70, 19th, W.S.W.; 41, 20th, W.S.W.; 38, 21st, N.W.; 41,22d, W.; 53,24th, W.; 57,29th, E.S E.

Snow, 1st, 3d, 4th, 5th, 9th, 10th, 14th, 18th, 19th, 22d.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.38	29.66	29.960	32.	36.	11 P	24.	19.	6 A	28.3	0
2	29.94	29.61	29.770	38.	40.	10 A	24.	23.	12 P	33.9	10
3	30.04	29.94	29.987	25.	27.	4 P	20.	17.	5 A	22.3	0
4	29.97	29.92	29.940	30.	32.	4 P	22.	15.	5 A	26.5	0
5	30.04	29.97	30.007	32.	34.	3 P	28.	26.	6 A	30.1	0
6	30.03	28.78	29.310	45.	49.	6 P	32.	36.	6 A	39.3	0
7	29.69	28.785	29.370	45.	41.	1 A	36.	31.	11 P	39.2	1
8	30.06	29.69	29.987	38.	40.	11 A	32.	28.	10 P	35.8	8
9	30.00	29.31	29.543	32.	33.	6 A	28.	26.	6 P	29.8	0
10	29.80	29.40	29.710	32.	34.	3 P	23.	19.	6 A	28.0	8
11	29.82	29.54	29.653	30.	34.	2 P	24.	21.	12 P	27.8	7
12	30.30	29.82	30.140	28.	34.	3 P	23.	15.	6 A	24.5	10
13	30.28	29.52	29.913	28.	33.	8 P	22.	17.	6 A	24.2	0
14	30.08	29.51	29.937	31.	32.	4 P	22.	17.	8 A	27.4	8
15	30.16	29.86	29.980	42.	44.	5 P	24.	18.	7 A	34.0	7
16	30.28	29.86	30.067	40.	44.	3 A	6.	5.	12 P	21.0	7
17	30.52	30.28	30.460	6.	8.	6 P	−9.	−14.	8 A	−1.7	10
18	30.47	29.98	30.310	21.	20.	5 P	−4.	−9.	5 A	7.5	8
19	29.98	29.36	29.603	32.	29.5	5 P	14.	11.	8 A	22.0	8
20	29.77	29.47	29.627	22.	31.	1 A	14.	8.	7 A	17.7	9
21	30.20	29.77	30.047	17.	19.	2 P	14.	9.	8 A	15.3	10
22	30.26	30.14	30.200	27.	28.	4 P	11.	4.	6 A	20.1	8
23	30.15	29.80	29.917	42.	42.5	11 P	22.	12.	6 A	33.7	8
24	29.90	29.77	29.820	42.	45.	1 P	31.	29.	12 P	39.0	9
25	30.00	29.90	29.980	30.	23.	1 A	13.	11.	12 P	20.3	10
26	30.00	29.81	29.870	23.	23.	6 P	7.	2.	7 A	14.5	6
27	29.97	29.86	29.940	33.	36.	4 P	12.	10.	8 A	23.3	9
28	30.00	29.97	29.983	50.	50.	5 P	29.	12.	6 A	38.9	7
29	29.98	29.51	29.803	53.	53.	3 P	40.	36.	7 A	48.2	0

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*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

	HUMIDITY.			WIND.					PRECIPITATION.				
											TOTAL IN INCHES.		
DAY.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.	RAIN.*	SNOW.
1	26.3	.151	96.7	W.S.W	14	0	0	0	†	4-30 P	0.50	0.52	4.5
2	23.0	.176	70.3	W.	267	12.5	50	11-30 A					
3	16.3	.113	83.3	N.	225	6.5	36	1 A	7 P	12 P			
4	17.3	.150	100.	N.	180	1.25	16	5 A	0 A	12 P			
5	29.0	.171	95.0	N.	141	1.25	16	6 A	0 A	12 P			4.0
6	39.7	.273	90.3	E.N.E	359	18.5	61	2 P	0 A	12 P	0.49	1.40	
7	29.7	.208	79.0	N.W.	427	17.	58	10 A	0 A	7-30 A	0.11	0.20	/
8	26.0	.199	73.7	W.N.W	334	11.	47	3 A					
9	27.3	.164	93.3	N.	174	3.	25	4-30 P	†	6-30 P	0.30	0.40	2.75
10	26.7	.157	94.3	W.N.W	228	8.5	41	3 A					
11	25.3	.151	92.7	W.N.W	332	23.	68	7 P	7-30 A	10 A	T.	T.	T.
12	21.7	.128	94.0	N.W.	268	11.5	48	0 A					
13	23.7	.129	100.	S.W.	66	0	0	0	7-00 A	11 P	0.50	0.60	3.5
14	24.7	.142	94.7	N.W.	214	14.5	54	6 P		4-30 P	T.	T.	T.
15	30.7	.205	87.7	S.S.W.	217	4.75	31	3 A					
16	13.0	.084	99.0	N.N.W.	293	8.25	41	8-30 A					
17	-4.0	.039	100.	N.N.W.	227	6.25	35	1 A					
18	7.7	.070	98.0	N.N.W.	200	4.25	29	0 A	8-45 P	12 P			T.
19	22.3	.144	84.7	S.E.	147	24.5	70	10 P	0 A	8 P	0.02	0.03	0.75
20	14.3	.096	91.0	W.S.W.	273	8.5	41	3 P					
21	10.7	.080	92.0	W.	250	7.	38	4 P					
22	16.3	.115	86.0	S.W.	277	8.25	41	2 P	11-15 P				T.
23	28.0	.230	71.0	W.S.W.	120	2.25	21	2 P	2-15 P	6 P	0.01	0.03	
24	22.3	.223	54.7	W.	347	14.	53	9-30 A					
25	9.0	.086	81.7	N.W.	255	5.	32	1-30 P					
26	14.0	.092	95.3	W.N.W	55	0	0	0					
27	14.3	.142	67.3	S.W.	60	0.5	10	12 P					
28	35.7	.283	75.3	S.	296	3.5	27	1 P					
29	46.3	.352	91.3	S.E.	199	16.	57	12 P	4 A	12 P	1.05	1.49	—

*First column denotes reading at top of tower, the second at base. T=trace. † early.

REMARKS.

The past month has been one of climatic extremes, giving us a taste of both the biting cold of mid-winter and the mild, soft days of spring.

The first eleven days of the month with the exception of the 3rd. instant, were considerably above the average temperature for February, the following eleven days, excepting the 14th. and 15th. instants decidedly below,—reaching a minimum 14° below zero, in the ground shelter, and a mean for the day 1.7° below zero, on the 17th. instant. After this time, (i. e. the 22nd. inst.) the temperature was more variable, but the month closed with springlike days, a heavy rain, and the ground clear of snow and free from frost.

The month has been exceedingly windy; the mean barometric pressure unusually low; the relative humidity of the atmosphere large; and the precipitation above the average, though the snowfall has been very light.

The worst storm of the month was the hurricane of the 6-7th. inst., during which, at its maximum, the wind blew at the rate of 60 miles an hour for over an hour, as indicated by the anemometer. The barometer fell exceedingly rapidly just before and during this storm, in all 1.23 inches in 24 hours, on the 6th. inst., from 0 A. M. to 12 P. M., or 1.0 inch in 11 hours, between 7 A. M. and 6 P. M.

LEONARD METCALF, Acting Meteorologist.

C. A. KING, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 87. MARCH, 1896.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.28, 9 A., 24th
Actual minimum reading,	28.77, 6 A., 12th
Mean reduced to sea level,	29.962
Monthly range,	1.51

****Air Temperature.*** In Degrees Fahr.

Highest,	55, 57, 31st
Lowest,	6, 5, 14th
Mean,	29.4 ; 29.2
Monthly Range,	49. ; 52.
Highest mean daily,	47, 31st
Lowest mean daily,	17.8, 13th
Mean maximum,	38.8 ; 37.8
Mean minimum,	21.1 ; 20.6
Mean daily range,	17.7 ; 17.2
Greatest daily range,	35., 40., 18th
Least daily range,	5., 7th ; 6., 12th

Humidity.

Mean dew point,	25.6
Mean force of vapor,	.175
Mean relative humidity,	85.3

Wind.

Prevailing Directions.

North,	13 per cent.
North West,	16 " "
West,	13 " "
West North West,	26 " "
Other directions,	32 " "
Total movement,	8182 m.
Greatest daily movement,	620 m., 4th
Least daily movement,	78 m.; 18th
Mean daily movement,	264. m.
Mean hourly velocity,	11. m.

Maximum pressure per square foot, 19. lbs. =62 m. per hour, 4th, 8-30 A. M.

****Precipitation.*** In inches.

Total precipitation,	6.11
Number of days on which .01 inch or more rain or melted snow fell,	12
Snow total in inches,	17

Weather.

Mean cloudiness observed,	54 per cent.
Total cloudiness recorded by the Sun Thermometer,	162 hours or 44 per cent.
Number of clear days,	13
Number of fair days,	8
Number of cloudy days,	10

Bright Sunshine.

Number of Hours recorded, ... 210 or 56 %

Rain, 1st, 2nd, 7th, 19th, 20th, 21st, 23d, 26th, 29th, 30th.

Gales, of 35 or more miles per hour, 38, 1st, E.S.E.; 41, 2d, N.W.; 61, 3d, N.N.W.; 62, 4th, N.N.W.; 58,5th, N.; 36,6th, N.;56, 8th, W.N.W.; 56,9th,N.W.; 45,11th, N.N.E.; 59, 12th, W.; 48, 13th, W.S.W.; 55, 20th, W.N.W.; 45,22d,S.W.; 40,24th,N.; 40,25th,S.W.; 39,26th, N.W.; 52, 27th, W.N.W.; 36,31st, W.N.W.

Snow,	11th, 12th, 15th, 16th, 19th.
Solar Halo,	10th.
Lunar Halo,	25th.
Sleet.	21st.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	29.54	29.44	29.463	50.	53.	12 M	42.	41.	12 P	46.1	0
2	29.62	29.50	29.600	40.	42.	1 A	23.	23.	11 P	28.1	0
3	29.72	29.55	29.643	28.	28.	12 M	19.	19.	5 A	23.9	4
4	29.73	29.64	29.687	32.	28.	1 P	14.	17.	9 P	21.7	10
5	29.97	29.72	29.817	36.	33.	4 P	16.	15.	6 A	22.9	11
6	30.06	29.97	30.030	43.	42.	4 P	20.	19.	6 A	31.7	10
7	30.05	29.64	29.740	36.	38.	7 P	31.	31.	6 A	34.3	3
8	29.80	29.67	29.707	35.	38.	2 P	24.	24.	12 P	31.2	4
9	29.92	29.78	29.847	28.	35.	2 P	21.	24.	6 A	25.8	5
10	29.93	29.83	29.887	45.	40.	5 P	19.	19.	7 A	29.1	11
11	29.88	29.18	29.643	36.	31.	2 A	19.	19.	9 P	27.4	0
12	29.98	29.05	29.440	22.	22.	12 M	16.	16.	11 P	20.1	6
13	30.42	29.98	30.250	23.	22.	6 P	11.	11.	6 A	17.8	11
14	30.55	30.42	30.503	26.	25.	4 P	6.	5.	7 A	18.6	11
15	30.54	30.21	30.413	30.	29.	3 P	8.	7.	7 A	23.5	8
16	30.21	29.74	29.993	35.	30.	3 P	22.	22.	6 A	26.1	0
17	30.25	29.73	29.980	37.	39.	6 P	27.	26.	6 A	30.9	11
18	30.38	30.25	30.347	50.	48.	5 P	15.	8.	8 A	31.7	12
19	30.34	29.25	29.777	53.	48.	11 P	28.	27.	10 A	35.5	0
20	29.92	29.16	29.533	48.	36.	1 A	22.	21.	11 P	32.6	5
21	30.20	29.92	30.133	40.	40.	5 P	12.	10.	4 A	29.3	12
22	30.35	30.09	30.167	45.	45.	3 P	30.	30.	12 P	36.5	8
23	30.51	30.35	30.483	26.	26.	1 A	14.	15.	8 A	21.5	6
24	30.56	30.50	30.543	37.	38.	6 P	11.	10.	7 A	19.7	12
25	30.53	30.07	30.303	43.	41.	4 P	14.5	13.	6 A	29.0	10
26	30.07	29.44	29.667	54.	54.	4 P	33.	33.	2 A	42.0	2
27	30.09	29.48	29.867	34.	30.	1 A	21.	23.	10 A	25.6	9
28	30.26	30.09	30.227	46.	45.	5 P	19.	19.	5 A	32.3	12
29	30.25	29.95	30.080	37.	36.	6 P	26.	24.	5 A	31.6	0
30	30.02	29.89	29.943	53.	53.	4 P	32.	32.	5 A	38.5	5
31	30.16	30.02	30.107	55.	57.	3 P	39.	35.	12 P	47.0	12

*First column denotes reading at top of tower, the second at base.

DAILY SUMMARY.

	HUMIDITY.			WIND.					PRECIPITATION.			
											TOTAL IN INCHES.	
DAY.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.*	SNOW.
1	45.0	.318	95.3	N.E.	230	7.25	38	1 A	0 A	12 P		
2	44.7	.145	92.7	W.N.W	370	8.25	41	3-30 P	0 A	12 P	0.14	
3	21.0	.126	91.3	N.W.	560	18.5	61	3 P				
4	14.3	.116	75.3	N.W.	620	19.	62	8-30 A				
5	13.0	.127	66.0	N.N.W.	540	14.5	58	7 P				
6	14.3	.205	68.3	N.E.	200	6.5	36	1 A				
7	25.7	.190	87.0	N.N.W.	210	5.5	33	7-30 P	4-30 A	4 P	0.64	
8	24.3	.170	79.0	W.N.W	390	15.5	56	11 A				
9	19.0	.143	73.3	N.W.	370	15.5	56	1-30 P				
10	23.0	.176	75.0	W.	157	5.	32	0-30 A				
11	25.0	.137	100.	N.N.E	233	10.	45	8 P	1 P	12 P		
12	19.3	.111	95.3	N.W.	360	17.5	59	1-30 P	0 A	10 A	0.40	4.
13	12.0	.104	76.3	W.N.W	234	11.5	48	0 A				
14	14.7	.108	85.0	W.	156	5.	32	2 P				
15	23.0	.135	94.7	S.S.W.	84	0.5	10	5 P	3-30 P	12 P		
16	26.3	.148	98.0	N.	198	1.5	17	9 P	0 A	12 P	1.0	10.
17	27.3	.175	86.7	N.W.	284	4.75	31	11 A				
18	28.3	.192	89.3	S.	78	0.75	12	6 P				
19	37.7	.228	100.	W.N.W	175	4.	28	8 P	6-40 A	12 P		
20	23.3	.165	77.3	W.	359	15.	55	1 P	0 A	3 A	2.75	3.
21	25.0	.173	79.7	W.N.W	177	3.	25	12 P	9-15 A	9-20 A	T.	
22	32.7	.229	83.7	W.	301	10.	45	3 P				
23	19.3	.116	94.0	N.N.W.	194	5.	32	4 A	3-45 P	7-50 P	T.	
24	15.0	.101	88.7	N.	220	8.	40	8 A				
25	28.7	.198	83.3	S.S.W.	207	8.	40	2 P				
26	41.3	.295	91.7	S.S.W.	333	7.5	39	11 P	6-30 P	10 P	0.10	
27	22.0	.128	93.7	W.N.W	368	13.75	52	6 A				
28	28.3	.187	87.0	W.N.W	174	3.	24	3-30 P				
29	33.3	.193	98.7	N.	92	2.5	22	3 P	5 A	12 P		
30	35.0	.251	83.7	N.	116	1.75	19	12 P	0 A	10 A	1.08	
31	30.7	.341	53.3	W.N.W	192	6.5	36	3-30 P				

*At base of tower. T=trace.

REMARKS.

The past month has been a typical March, cold and windy in its early days, and warm and springlike toward its close. The mean temperature has been considerably below our normal temperature,—about five degrees,—that of the 1st, 19th, 22d, 26th, 30th, and 31st instants only, being above the normal. The range of barometric pressures has been unusually large, varying from 30.28 inches to 28.77 inches of mercury. The total wind movement for the month was the largest on record here for March, 8182 miles; the greatest daily movement being 620 miles on the 4th instant.

The snowfall on the 15th-16th instants was the heaviest of the winter; the total for the month being the same as that for March, 1890, seventeen inches. The total precipitation was unusually heavy, 6.11 inches. and considerable damage was done to the roads and fields by erosion, by the storms of Feb. 29 to March 3, March 19 to 20th, and March 29 to 30th.

"Seven cyclonic and six anticyclonic areas influenced our weather during the month. Of the former three passed easterly to the north of us, one moved across our district from the south, one from the west, and two moved up the Eastern coast. The high pressure areas were generally energetic and were accompanied by low temperatures. The heavy rains of Feb. 29 to March 3d occurred in a storm which moved from the southwest over eastern New York, across southern New England from west to east, on the first, and then passed slowly along our coast, increasing in energy. Roads were badly washed and much damage was done along river valleys by high water and broken ice. It is feared that in some sections the frequent freezing and thawing of the ground has worked some injury to clover and other grasses." (J. Warren Smith, New England Weather Bureau.)

LEONARD METCALF, Acting Meteorologist.

C. A. KING, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 88. APRIL, 1896.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.28, 8 A., 9th
Actual minimum reading,	29.33, 3 P., 3rd
Mean reduced to sea level,	30.168
Monthly range,	0.95

****Air Temperature.*** In Degrees Fahr.

Highest,	88.5; 88.5, 16th
Lowest,	22, 21, 3rd
Mean,	49.2.
Monthly Range,	66.5; 67.5
Highest mean daily,	68.7, 16th
Lowest mean daily,	27.2, 3rd
Mean maximum,	60.5; 60.7
Mean minimum,	37.4; 36.0
Mean daily range,	23.1; 24.8
Greatest daily range,	43.5; 47.; 16th
Least daily range,	7.; 4 on 2nd

Humidity.

Mean dew point,	35.9
Mean force of vapor,	.416
Mean relative humidity,	62.0

Wind.

Prevailing Directions.

South,	13 per cent.
South West,	10 “ “
West,	13 “ “
South South West,	10 “ “
West South West,	10 “ “
West North West,	10 “ “
Other directions,	34 “ “

Total movement,	4674 m.
Greatest daily movement,	412 m., 3d
Least daily movement,	59 m.; 9th
Mean daily movement,	155.8 m.
Mean hourly velocity,	6.5 m.
Maximum pressure per square foot,	18. lbs. =60 m. per hour, 3d, 5 P.

Precipitation. In inches.

Total precipitation,	1.32
Number of days on which .01 inch or more rain or melted snow fell,	4
Snow total in inches,	0.5

Weather.

Mean cloudiness observed,	39 per cent.
Total cloudiness recorded by the Sun Thermometer,	145 hours or 36 per cent.
Number of clear days,	16
Number of fair days,	6
Number of cloudy days,	8

Bright Sunshine.

Number of Hours recorded,	258 or 64 %

Rain, 1st, 2nd, 3d, 6th, 7th, 17th, 18th, 19th, 21st, 22d.

Gales, of 35 or more miles per hour, 40, 2d, W.N.W.; 60, 3d, N.W.; 47, 4th, N.W.; 38, 17th, S.E.; 41, 20th, N.W.; 46, 23rd, W.N.W; 36, 28th, S.S.W.

Snow,	1st, 2nd, 3d, 7th.
Rainbow,	6th.
Thunder and Lightning,	17th, 19th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.22	30.06	30.140	53.	53.	4 P	30.	27.	6 A	42.1	12
2	30.07	29.66	29.783	39.	36.	1 A	32.	32.	12 P	34.0	0
3	29.69	29.61	29.653	32.	31.5	4 P	22.	21.	7 A	27.2	9
4	30.01	29.68	29.843	29.	36.	2 P	23.	23.	6 A	27.4	4
5	30.27	30.01	30.193	40.	42.	3 P	27.5	27.	6 A	34.8	5
6	30.26	30.12	30.167	46.	42.5	5 P	27.5	25.	6 A	36.9	11
7	30.37	30.14	30.247	37.	34.5	1 P	31.5	31.	12 P	35.2	0
8	30.55	30.36	30.490	45.	45.	6 P	29.	28.5	7 A	36.9	12
9	30.56	30.39	30.480	55.	55.	6 P	26.5	23.5	7 A	40.7	13
10	30.41	30.32	30.373	59.	59.	7 P	25.	23.5	7 A	42.7	13
11	30.38	30.22	30.293	57.	58.	3 P	31.5	30.	7 A	44.6	7
12	30.39	30.28	30.357	68.	66.5	3 P	35.	33.5	5 A	50.1	13
13	30.31	30.03	30.093	83.	83.	4 P	41.5	41.	5 A	60.7	11
14	30.13	30.00	30.100	65.	65.5	6 P	42.5	40.5	6 A	53.7	4
15	30.19	30.08	30.163	82.	81.	4 P	41.	39.	7 A	62.9	13
16	30.19	30.08	30.137	88.5	88.5	5 P	45.	41.5	6 A	68.7	13
17	30.12	30.02	30.097	82.	84.5	2 P	53.	53.	7 A	66.3	10
18	30.11	30.04	30.067	78.	81.2	3 P	54.5	53.	6 A	67.2	3
19	30.15	30.03	30.097	72.	76.	4 P	55.5	53.	6 A	64.7	2
20	30.18	29.98	30.087	72.	73.1	5 P	56.	55.5	5 A	65.0	13
21	29.98	29.83	29.893	61.	62.4	1 A	44.	43.	12 P	54.8	0
22	30.15	29.78	29.967	45.	49.	3 P	39.	39.	9 A	42.5	0
23	30.23	30.13	30.180	62.	65.	5 P	31.5	29.	5 A	49.6	13
24	30.26	30.16	30.227	62.	65.	4 P	39.	39.	5 A	49.3	8
25	30.31	30.24	30.280	60.	60.	* *	32.5	29.	* *	46.8	13
26	30.36	30.26	30.293	65.5	65.5	* *	41.	39.	* *	55.6	13
27	30.48	30.36	30.457	69.5	62.	* *	39.	33.5	* *	51.8	13
28	30.47	30.28	30.360	66.9	64.8	* *	36.	35.5	* *	52.4	6
29	30.30	30.21	30.257	71.0	70.5	* *	48.8	48.	* *	57.7	11
30	30.36	30.21	30.280	70.5	66.	* *	42.	42.	* *	52.5	13

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*First column denotes reading at top of tower, the second at base.

* * Draper Thermograph out of order. Max. and min. temperatures by self-recording thermometer made by H. I. Green.

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
											RAIN.*	SNOW.
1	28.3	.292	57.3	W.N.W	86	1.75	18	10 P	9-30 P	12 P		
2	32.3	.199	95.0	N.	120	8.	40	11 P	0 A	5 P	0.50	0.5
3	21.0	.143	81.0	W N W	412	18.	60	5 P	11-25 A			T.
4	18.7	.149	70.0	N.W.	333	11.	47	5 A				
5	23.0	.215	60.3	N.N.W.	289	5.	32	12 M				
6	28.7	.231	72.0	S.S.W.	68	0.5	10	2 P	5-30 P		T.	
7	28.0	.197	78.0	E.	198	4.5	30	3 P	11-40 A	2-10 P		T.
8	19.0	.226	51.3	N.	233	5.0	32	9 A				
9	20.7	.268	47.0	W.S.W.	59	1.5	17	8 P				
10	18.7	.349	40.7	S.W.	116	2.	20	4 P				
11	33.7	.333	60.7	W.	129	2.25	21	2 P				
12	35.0	.401	56.3	W.	118	5.	32	8 P				
13	49.3	.692	57.7	S.	228	1.	14	4 P				
14	45.0	.440	71.7	S.W.	85	0.5	10	2 A				
15	49.0	.615	65.3	W.	68	2.	20	7 P				
16	51.7	.836	52.3	W.	89	2.5	22	1 P				
17	56.7	.776	65.0	S.	113	7.	38	4 P	3-45 P	6 P	0.10	
18	57.7	.748	71.0	S.	118	5.5	35	1-30 P	7-45 A		T.	
19	61.0	.632	87.7	S.W.	70	3.5	26	7 A	12 M	8-30 P	0.50	
20	42.7	.629	44.3	N.W.	216	8.5	41	1-45 P				
21	44.0	.454	66.7	E.S.E.	182	1.5	18	1-30 P	4-25 P	12 P	T.	
22	35.0	.284	73.7	N.N.E	200	5.5	33	2 P	0 A	1 P	0.22	
23	32.3	.393	55.3	W.S.W.	121	10.5	46	2-15 P				
24	31.0	.409	46.3	W.S.W.	135	2.5	22	3 P				
25	30.3	.335	54.3	S.E.	151	3.	24	12-30 P				
26	35.7	.450	49.0	S.	114	1.25	16	8 P				
27	38.7	.417	62.0	S.S.W.	144	3.5	26	7-30 P				
28	45.3	.421	77.0	S.S.W.	207	6.5	36	4 P				
29	36.7	.490	49.7	W.N.W	170	4.5	30	9-30 A				
30	28.3	.450	40.0	E.S.E.	102	2.5	22	7-30 P				

*At base of tower. T=trace.

REMARKS.

The most notable features of the weather during the past month were the high temperature and the small rainfall. The amount of sunshine too has been unusually large, being 15% in excess of the normal for April, and the last half of the month has been further characterized by hot days and cool nights.

The first eleven days of April were from 4° to 20° colder than normal and the season was decidedly backward. Then followed ten days of very warm weather in the course of which the excess of temperature reached a maximum of 20° above normal on the 16th inst. and during which vegetation was given a good start and made rapid progress. While the temperature during the remainder of the month, with the exception of the 22d and 25th insts. was also above the mean, the season since then has advanced more slowly.

With reference to the excessively hot week about the middle of the month when the temperature reached the unprecedented maximum of 88.5° at Amherst on the 16th inst., the New England Weather Bureau reports that:—

"During the third week of the month, from April 14 to 20th, the temperature over the greater part of the State averaged from 9° to 20° a day warmer than usual for this period. This week was probably the most abnormal with respect to the distribution of temperature in the United States in the history of the Government Bureau. The whole eastern half of the country was abnormally warm, reaching an average of 24° a day above normal in the vicinity of New York, while the western part of the United States was abnormally cold, with a daily temperature of 21° below the normal in Montana. During this spell there was a trough of low pressure extending from the eastern Lakes and St. Lawrence Gulf southwestward to Texas, with indefinite cyclonic storms drifting slowly eastward, while over the southeastern coast and the northwestern part of the United States there were areas of nearly stationary high pressure. When such a distribution of air pressure prevails we may always look for generally fair and warm weather in New England."

The past winter and early spring have been very severe on vegetation in the vicinity of Amherst. The peach crop was winter killed; cherry tree blossoms seem to be few in number, and winter grains, clover, newly sown mowings, strawberries, raspberries and rose bushes have been generally and seriously affected.

Yet the season has advanced to its normal degree, despite a number of frosts during the early part of the month, and duringthe latter part of the month, even, in the lowlands, though the deficiency in rainfall is making itself felt to an increasing extent. The small rainfall has had the effect of delaying the settling of the ground since the frost came out and of keeping the grass and mowing back, but the continued clear and dry weather has brought the soil into good condition for working and the weather has been generally favorable for planting. Oats are generally sown; and early potatoes and onions have been planted.

Cattle have been put out to pasture to some extent.

On the morning of April 16, 1896, Charles A. King, a member of the class of '97 in the Massachusetts Agricultural College, and Observer at the Meteorological Observatory of the Hatch Experiment Station, died of pneumonia. He had been connected with the observatory work since the fall of 1894 and and had been the Observer since August, 1895. A good student, a faithful and honest observer, and a conscientious man, his death is not alone a grief to his friends and instructors, but a loss to the Department and the Service.

LEONARD METCALF, Acting Meteorologist.
JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.

Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 89. **MAY, 1896.**

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.20, 9 A., 7th
Actual minimum reading,	29.45, 7 A., 31st
Reduced maximum reading,	30.48, 9 A., 7th
Reduced minimum reading,	29.73, 7 A., 31st
Mean reduced to sea level,	30.083
Monthly range,	0.75

****Air Temperature.*** In Degrees Fahr.

Highest,	93.8; 94.3, 10th
Lowest,	35.5; 32.0, 1st
Mean,	62.4.
Monthly Range,	58.3; 62.3
Highest mean daily,	81.0, 10th
Lowest mean daily,	48.6, 6th
Mean maximum,	75.4; 74.6
Mean minimum,	49.9; 47.5
Mean daily range,	25.5; 27.1
Greatest daily range,	43.5; 43.8; 9th
Least daily range,	10.1; 10.5, 21st

Humidity.

Mean dew point,	48.3
Mean force of vapor,	0.610
Mean relative humidity,	62.5

Wind.

Prevailing Directions.

South,	16 per cent.
South West,	13 " "
West,	13 " "
South South West,	16 " "
Other directions,	42 " "

Total movement,	4838 m.
Greatest daily movement,	308 m., 18th
Least daily movement,	77 m., 15th
Mean daily movement,	156 m.
Mean hourly velocity,	6 m.
Maximum pressure per square foot,	25 lbs. =71 m. per hour, 18th, 8 A.

Precipitation. In inches.

Total precipitation,	2.58
Number of days on which .01 inch or more rain fell,	7.

Weather.

Mean cloudiness observed,	40 per cent.
Total cloudiness recorded by the Sun Thermometer,	156 hours or 35 per cent.
Number of clear days,	14
Number of fair days,	10
Number of cloudy days,	7

Bright Sunshine.

Number of Hours recorded, 297 hours or 65%

Rain, 3d, 9th, 11th, 14th, 15th, 17th, 18th, 19th, 21st, 24th, 25th, 26th, 28th, 29th, 31st.

Last frost, 1st; 20th in lowlands.

Gales, of 35 or more miles per hour, 37, 5th, N.W.; 49, 10th, W.N.W.; 35, 12th, N.; 46, 13th, N.N.E.; 42, 16th, W.; 71, 18th, W.; 36, 19th, N.W.; 35, 26th, S.S.W.; 35, 27th, W. S.W.; 40, 30th, S.W.

Thunder and Lightning, 9th, 19th, 28th.

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*The first figures denote readings at top of tower, the second at base.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	MEAN HOURLY.	
1	30.27	30.18	30.226	73.	69.	* *	35.5	32.	* *	52.2	14
2	30.29	30.23	30.263	64.6	62.4		35.8	33.3		54.5	8
3	30.24	30.06	30.113	64.9	64.8		47.3	46.2		57.4	0
4	30.06	29.94	29.977	82.	80.8		53.0	51.7		68.4	14
5	30.05	29.85	29.943	79.2	79.1		54.8	52.6		63.9	12
6	30.46	30.05	30.327	56.6	58.5		46.8	45.8		48.6	1
7	30.48	30.41	30.437	70.	66.6		42.5	41.7		50.5	14
8	30.43	30.22	30.277	76.5	74.6		39.5	37.2		57.0	12
9	30.22	29.92	30.003	92.3	91.3		48.8	47.5		74.3	14
10	29.93	29.73	29.827	93.8	94.3		68.2	66.6		81.0	14
11	29.93	29.81	29.883	86.9	86.1		64.7	61.6		73.0	11
12	30.12	29.92	29.997	77.6	76.3		52.2	53.5		64.9	11
13	30.20	30.12	30.190	81.2	77.3		42.4	38.5		62.1	14
14	30.18	29.98	30.063	79.7	79.2		42.7	38.4		62.7	11
15	30.14	29.98	30.050	74.9	75.1		59.2	59.		64.8	6
16	30.17	30.06	30.117	79.1	80.2		50.8	47.3		72.8	14
17	30.09	29.83	29.993	81.3	80.8		55.9	51.3		69.7	10
18	29.88	29.80	29.850	82.2	84.3		61.0	56.4		69.9	13
19	30.15	29.81	29.950	73.8	74.3		58.1	53.6		58.9	4
20	30.40	30.15	30.353	72.2	70.2		36.8	34.3		55.5	14
21	30.35	30.13	30.263	58.	57.3		47.9	46.8		51.8	0
22	30.12	29.99	30.030	83.	84.2		50.8	50.2		69.9	10
23	30.36	30.10	30.267	71.8	70.3		52.9	48.3		63.0	11
24	30.45	30.36	30.423	67.3	62.4		46.6	44.7		56.8	4
25	30.40	30.19	30.273	70.2	70.5		42.9	40.3		56.3	13
26	30.19	29.78	29.873	75.2	73.2		45.9	44.7		63.5	1
27	30.08	29.85	29.990	78.6	79.2		59.3	52.6		67.1	14
28	30.11	29.85	29.990	72.3	72.7		48.8	45.3		61.1	5
29	29.98	29.84	29.897	72.9	71.9		54.2	53.6		62.1	8
30	29.96	29.89	29.933	74.8	73.1		45.7	43.8		62.6	14
31	29.91	29.73	28.807	71.2	73.3		54.3	53.3		59.2	6

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*First column denotes reading at top of tower, the second at base.

* * Thermograph under repair.

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
											RAIN.*	SNOW.
1	36.3	.427	57.7	S.S.E.	156	4.5	30	7-30 P				
2	32.7	.445	45.0	S.	173	3.75	27	4 P				
3	50.3	.471	77.7	S.S.W.	231	2.5	22	2 P	11-30 A		T.	
4	53.3	.716	61.7	N.W.	124	2.	20	5 P				
5	49.0	.670	56.3	W.	169	7.	37	12 M				
6	42.0	.354	75.0	N.E.	252	3.5	26	10-30 A				
7	34.0	.401	53.0	E.	183	1.5	17	11-30 A				
8	46.0	.509	65.7	S.	139	1.25	16	7 P				
9	56.7	.899	56.0	S.W.	138	3.5	26	5 P	3-55 A	5 A	0.16	
10	58.7	1.084	47.0	W.	151	12.	49	8 P				
11	59.7	.862	63.3	S.W.	118	5.5	33	4-30 P	4-30 P		T.	
12	45.7	.633	51.3	N.	158	6.	35	2-30 P				
13	42.0	.580	49.3	N.	92	10.5	46	6 P				
14	53.0	.600	72.3	S.	135	3.5	26	6-30 P	5 P		T.	
15	54.3	.603	76.0	N.W.	77	4.5	30	10 P	2 P		T.	
16	37.7	.786	35.3	W.N.W	204	8.75	42	10 A				
17	53.0	.735	57.3	S.	101	2.5	22	8-30 P	2-30 P	7 P	T.	
18	48.0	.800	47.3	W.S.W.	308	25.	71	8 A	5-30 P	6-30 P	T.	
19	52.7	.539	75.3	W.	157	6.5	36	1-30 P	10 A	2-30 P	0.04	
20	40.0	.484	56.7	S.S.W.	101	3.5	26	5 P				
21	48.7	.385	88.3	E.	81	0.	0	—	7 A	3-30 P	0.04	
22	53.7	.759	61.7	S.S.W.	160	5.5	33	3 P				
23	51.0	.603	64.0	N.N.E.	161	5.	32	11-30 A				
24	44.7	.496	62.7	S.	108	3.	24	12-30 P	4 P		T.	
25	43.0	.484	61.3	S.S.W.	141	5.	32	9 P	7-30 A		T.	
26	59.3	.574	90.7	S.S.W.	294	6.	35	12 M	3 A	10-30 P	0.20	
27	51.0	.731	54.0	S.W.	182	6.	35	2 P				
28	53.7	.584	74.7	E.S.E.	158	3.	24	3 P	12-45 M	12 P	0.91	
29	49.7	.591	64.7	W.	108	2.5	22	3 P	0 A	1-30 A	0.45	
30	47.0	.588	57.0	S.W.	136	8.	40	4 P				
31	52.0	.515	78.3	N.N.W.	142	3.	24	12 M	1-30 A	3-30 P	0.78	

*At base of tower. T=trace.

REMARKS.

The most noteworthy features of the past month were the deficiency of rainfall and the abundance of sunshine.

The total precipitation for the month was but 2.58 inches, of which less than one quarter of an inch fell before the 26th instant; the amount of sunshine recorded was 65%. The atmospheric pressure has been generally high and steady with a small range for the month. The mean daily temperature was about 4° above the normal but the nights have been generally cool and comfortable. The hottest day, the 10th inst., whose mean temperature was 81°, gave us a new maximum for May, 94.3°.

"Eight cyclonic and seven anticyclonic areas influenced the weather in New England during the month of May. During the first two-thirds of the month, these areas moved with little velocity or energy. The low pressure areas especially were poorly defined and gave only a moderate amount of clouds and very little rainfall in any section of our district. During the last week the cyclonic storms have been more energetic and have generated severe local storms. None of them, however, have been so severe in this section as in the Central States, as the storms have decreased in energy as they crossed the Lake region."—*N. E. Weather Bureau.*

The conditions for farm work have been generally good except in localities where the ground is naturally very dry. Planting is finished except in occasional late corn fields for the silo. Tobacco setting from hot beds was begun last week and is still in progress. Seeds have germinated well for the most part and the recent rains have given everything a good start. Grass-land, however, has felt the drought severely and the hay crop must inevitably suffer.

Violent winds, coupled with the extreme dryness, have done considerable damage. That of the 18th inst. was much the most serious one, shrivelling the tender leaves on many maples and other trees and shrubs, and doing much damage to the fine alluvial soils of the Connecticut valley in all exposed localities. It swept the surface soil off in many cases for a depth of upwards of three-quarters of an inch and laid bare or swept away the plant roots. The onion crop suffered most, though the injury was of a local character, confined to knolls and other exposed situations. Professor Brooks mentions among others one field of four acres in Sunderland meadows from which every vestige of the crop (onions) was swept away and the surface left seemingly as hard as a board floor. Insect pests have flourished in the dry weather and have done considerable damage.

LEONARD METCALF, Acting Meteorologist.
JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 90. JUNE, 1896.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading, . 30.14, 8 A., 25th
Actual min. reading, 29.31, 10th 5 P., 11th, 4 P.
Reduced maximum reading, 30.42, 8 A., 25th
Reduced min. reading, 29.59, 10th 5 P., 11th 4 P.
Mean reduced to sea level, ... 30.047
Monthly range, ... 0.83

****Air Temperature.*** In Degrees Fahr.

Highest, ... 91.0; 90.0, 21st
Lowest, ... 41., 11th; 39., 3d
†Mean, ... 65.0.
Monthly Range, ...50.0; 51.0
†Highest mean daily, ... 77.9, 20th
†Lowest mean daily, ... 52.6, 14th
Mean maximum, ... 77.2; 76.0
Mean minimum, ... 53.9; 52.1
Mean daily range, ... 23.3; 23.9
Greatest daily range, ... 40., 5th; 40.5; 3d
Least daily range, ... 5.0; 4.0, 14th

Humidity.

Mean dew point, ... 53.9
Mean force of vapor, ... 0.677
Mean relative humidity, ... 67.3

Wind.

Prevailing Direction, southwest.

Summary.

South, ... 20 per cent.
North, ... 10 " "
West, ... 10 " "
South South West, ... 23 " "
Other directions, ... 37 " "

Total movement, ... 3926 m.
Greatest daily movement, . . . 264 m., 14th
Least daily movement, ... 63 m., 3d
Mean daily movement, ... 130.9 m.
Mean hourly velocity, ... 5.5 m.
Maximum pressure per square foot, 7.75 lbs. =39 m. per hour, 11th, 10 A.

Precipitation. In inches.

Total precipitation, ... 2.57
Number of days on which .01 inch or more rain fell, ... 6.

Weather.

Mean cloudiness observed, . . . 47 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 194 hours or 42 per cent.
Number of clear days, ... 12
Number of fair days, ... 8
Number of cloudy days, ... 10

Bright Sunshine.

Number of Hours recorded, 236 hours or 58 %

Rain, 7th, 8th, 9th, 10th, 14th, 16th, 17th, 20th, 21st, 25th, 26th, 28th.

Gales, of 35 or more miles per hour, 36, 10th, N.N.E.; 39, 11th, N.W.; 37, 21st, S.W; 37, 22d, W.N.W.; 35, 23d, N.N.W.; 37, 29th, N.N.W.

Thunder and Lightning, ... 21st.

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*The first figures denote readings at top of tower, the second at base.

† In the ground shelter.

DAILY SUMMARY.

	BAROMETER REDUCED TO SEA LEVEL.			*TEMPERATURE.							NUMBER OF HOURS BRIGHT SUNSHINE.
DAY.	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.		TIME.	MINIMUM.		TIME.	† MEAN HOURLY.	
1	30.09	29.91	29.993	70.	70.5	* *	50.5	47.5	* *	59.9	11
2	30.22	30.09	30.150	70.	70.5		45.5	42.5		59.8	13
3	30.31	30.18	30.240	82.	79.5		42.	39.		66.2	15
4	30.20	30.09	30.140	83.	86.5		52.5	48.5		69.4	15
5	30.20	30.13	30.167	92.	87.5		50.	53.5		72.0	15
6	30.28	30.15	30.237	75.5	76.5		56.	54.		65.5	10
7	30.27	30.02	30.117	62.	60.		55.5	54.		58.7	0
8	30.02	29.83	29.913	60.5	61.5		55.	55.		58.8	0
9	29.83	29.63	29.690	82.5	79.5		55.	55.		68.7	3
10	29.76	29.59	29.667	79.	75.		56.5	55.		59.8	4
11	29.75	29.59	29.640	70.	70.5		41.	41.5		61.0	9
12	29.84	29.62	29.720	74.5	74.		51.5	47.		62.8	10
13	30.05	29.84	29.957	78.	76.5		48.5	44.5		63.6	13
14	30.15	30.02	30.063	56.	55.		51.	51.		52.6	0
15	30.31	30.15	30.257	64.	63.5		50.5	50.5		56.5	0
16	30.31	30.24	30.277	82.	78.		49.	47.5		64.9	14
17	30.23	30.11	30.153	68.5	68.		57.	56.5		63.8	0
18	30.10	30.02	30.060	83.	81.		61.5	60.		69.0	11
19	30.11	30.02	30.073	88.	86.5		57.	54.		72.3	14
20	30.05	29.99	30.030	90.	89.		66.5	65.		77.9	13
21	30.03	29.87	29.930	91.	90.		63.	61.5		73.5	13
22	29.94	29.82	29.870	85.	85.		65.	63.5		74.1	12
23	30.23	29.94	30.147	75.	74.5		56.	54.		62.5	16
24	30.40	30.23	30.340	76.	74.		47.	44.5		59.2	8
25	30.42	30.34	30.397	73.	71.5		50.	47.5		63.4	0
26	30.34	30.05	30.113	84.5	82.5		58.	56.5		70.0	4
27	30.14	29.98	30.067	85.5	82.5		58.5	54.		68.0	9
28	29.98	29.75	29.827	76.5	75.		58.	55.		63.9	3
29	30.06	29.77	29.913	81.5	81.		57.5	57.5		67.7	13
30	30.27	30.06	30.257	77.5	75.		52.5	49.0		64.5	15

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*First column denotes reading at top of tower, the second at base.

* * Draper Thermograph being readjusted. Temperature by Green maximum and minimum thermometers.

† In the ground shelter.

DAILY SUMMARY.

	HUMIDITY.			WIND.					PRECIPITATION.			
DAY.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
											RAIN.*	SNOW.
1	47.0	.528	61.0	N.W.	124	4.5	30	4 P				
2	45.0	.544	57.0	N.W.	142	3.5	26	12 M				
3	49.3	.683	57.0	S.	63	0.5	10	2 P				
4	54.3	.762	59.7	S.	117	1.	14	7-30 P				
5	52.3	.873	51.7	W.S.W.	76	0.5	10	2 P				
6	54.7	.710	64.7	E.	132	1.25	16	6 P				
7	56.7	.497	92.3	S.E.	133	1.	14	12 M	6-30 A	12 P	0.25	
8	57.3	.493	97.0	N.	78	0.75	12	9 A	0 A	4 P	0.94	
9	63.3	.707	86.7	S.S.W.	75	1.75	19	5 P			T.	
10	52.3	.542	74.7	N.N.W.	168	6.5	36	6 P	3 A	12-30 M	0.42	
11	48.0	.565	59.7	W.	180	7.75	39	10 A				
12	52.7	.615	66.0	W.N·W	153	1.	28	1 P				
13	50.7	.659	60.0	E.	89	0.5	10	2 P				
14	48.3	.382	90.3	N.	264	5.	32	6-30 P	6 A	4 P	0.51	
15	49.7	.492	72.7	N.N.W.	175	3.	24	9-30 A				
16	53.3	.661	67.7	S.S.W.	67	2.	20	5 P	7-15 P	12 P	T.	
17	60.0	.594	88.0	S.	142	2.75	23	4 P	0 A	3 P	0.27	
18	62.0	.787	73.3	S.S.W.	87	0.	0	—				
19	62.3	.938	62.3	S.S.E.	69	3.5	26	3 P				
20	66.3	1.020	66.0	S.	135	2.	20	4 P	4 A		T.	
21	66.0	.957	74.0	S.	106	7.	37	4-30 P	4-45 P	6-30 P	0.18	
22	55.0	.900	52.7	W.	188	7.	37	12-30 M				
23	51.7	.616	45.0	N.	218	6.	35	1 P				
24	49.7	.584	63.3	S.S.W.	65	1.25	16	7 P				
25	53.3	.618	68.3	S.S.W.	112	2.25	21	7 P			T.	
26	59.0	.771	70.3	S.S.W.	191	3.5	26	8 A	6-30 A	7-30 A	T.	
27	56.3	.783	61.3	S.S.W.	71	1.5	17	4 P				
28	59.0	.632	81.0	S.	123	5.5	33	2 P			T.	
29	45.0	.742	42.7	W.	217	7.	37	5 P				
30	47.7	.657	52.7	W.S.W.	166	4.25	29	3 P				

*At base of tower. T=trace.

REMARKS.

The past month presents few features of particular interest. It has been a normal June, though cool and dry in this vicinity.

While the amount of sunshine was in excess of the normal, the nights were generally cool and the mean temperature was more than two degrees below normal. There were some hot days during the month but the heat was neither excessive nor of long duration. The rainfall was deficient by nearly one inch.

The low temperature has had the effect of retarding the growth of tobacco, corn, squash, tomatoes, melons, etc. on all soils except those naturally warm. The weather was almost phenomenally favorable for tobacco setting during the early part of the month. The strawberry crop has been rather disappointing and raspberries are doing poorly, but the blackberries and currants promise well. Haying is well under way and the crop is generally light on all except the very fertile and moisture retentive soils, as was anticipated.

The cut-worms have been very numerous and troublesome, seriously thinning the fields of onions and tobacco as well as tender garden truck. The elm-leaf beetles are very abundant and doing much damage,as did the canker worms during the early part of the month.

LEONARD METCALF, Acting Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 91. JULY, 1896.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.21, 7 A., 19th
Actual min. reading,	29.43, 15th 6 P.
Reduced maximum reading,	30.49, 7 A., 19th
Reduced min. reading,	29.70, 15th 6 P.
Mean reduced to sea level,	30.094
Monthly range,	0.78

****Air Temperature.*** In Degrees Fahr.

Highest,	91.0; 29th
Lowest,	50.0; 17th
Mean,	70.7
Mean of means of max. and min.,	71.3
Mean sensible(wet bulb),	66.2
Monthly Range,	41.0
Highest mean daily,	78.0, 10th
Lowest mean daily,	59.4, 24th
Mean maximum,	81.5
Mean minimum,	61.1
Mean daily range,	20.4
Greatest daily range,	31.0; 1st, 18th
Least daily range,	10.0, 4th

Humidity.

Mean dew point,	62.4
Mean force of vapor,	0.828
Mean relative humidity,	73.4

Wind.

Prevailing Direction, south.

Summary.

South,	26 per cent.
Southwest,	10 " "
Southeast,	10 " "
South South West,	26 " "
Other directions,	28 " "
Total movement,	4048 m.
Greatest daily movement,	256 m., 20th
Least daily movement,	38 m., 14th
Mean daily movement,	130.6 m.
Mean hourly velocity,	5.4 m.
Maximum pressure per square foot,	8.5 lbs. =41 m. per hour, 3d, 1 P.

Precipitation. In Inches.

Total precipitation,	4.96
Number of days on which .01 inch or more rain fell,	12

Weather.

Mean cloudiness observed,	50 per cent.
Total cloudiness recorded by the Sun Thermometer,	202 hours or 44 per cent.
Number of clear days,	10
Number of fair days,	10
Number of cloudy days,	11

Bright Sunshine.

Number of Hours recorded, 260 hours or 56%

Rain, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 13th, 14th, 15th, 16th, 20th, 21st, 23d, 24th, 25th, 27th, 28th, 30th.

Gales, of 35 or more miles per hour, 41 m., 3d, E.; 36 m., 11th, W.N.W.; 35m., 31st, N.

Thunder and Lightning, 3d, 7th, 15th, 30th.

Solar Halo, ... 29th.

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* Temperature in ground shelter.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.&MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.32	30.25	30.290	87.5	3 P	56.5	5 A	72.	72.8	65.	15
2	30.31	30.15	30.243	87.5	2 P	60.5	5 A	74.	73.9	67.7	15
3	30.26	30.14	30.210	89.5	1 P	63.	12 P	76.2	69.2	65.	8
4	30.24	29.91	30.090	68.5	3 P	58.5	5 A	63.5	63.9	62.8	0
5	30.01	29.80	29.890	81.5	1 P	60.5	5 A	71.	70.7	67.7	10
6	30.09	30.00	30.073	77.	12 M	59.5	4 A	68.2	68.4	67.2	4
7	30.06	29.94	30.010	74.5	1 P	62.	12 P	68.2	65.6	65.	0
8	30.28	30.06	30.187	77.5	4 P	54.	4 A	65.7	66.2	62.7	5
9	30.35	30.29	30.340	81.5	6 P	62.5	3 A	72.	73.4	71.2	6
10	30.35	30.22	30.297	85.5	2 P	71.	12 P	78.2	78.	69.3	13
11	30.22	30.10	30.140	84.	4 P	67.5	2 A	75.7	76.5	68.8	11
12	30.13	29.99	30.070	89.	2 P	61.5	5 A	75.2	77.5	67.	14
13	30.04	29.95	29.973	87.	1 P	67.	3 A	77.	75.4	70.	9
14	30.00	29.93	29.967	86.	5 P	66.5	12 P	76.2	73.7	69.3	7
15	29.96	29.70	29.797	82.5	3 P	61.5	4 A	72.	70.9	69.8	0
16	30.01	29.76	29.870	77.5	3 P	63.5	12 P	70.5	68.4	59.5	11
17	30.33	30.01	30.190	77.5	6 P	50.	5 A	63.8	64.1	58.5	11
18	30.46	30.33	30.437	81.5	3 P	50.5	5 A	66.	67.0	60.7	14
19	30.49	30.36	30.417	80.	2 P	51.5	5 A	65.7	67.0	62.7	13
20	30.35	30.03	30.163	75.	6 P	61.	3 A	68.	68.7	68.3	0
21	30.14	30.01	30.097	84.	2 P	71.	1 A	77.5	76.1	73.7	6
22	30.14	29.85	30.017	82.5	4 P	69.	4 A	75.7	73.3	72.5	2
23	30.10	29.79	29.933	76.5	2 P	62.5	12 P	69.5	69.6	64.8	11
24	30.12	29.85	30.027	68.5	11 A	52.5	4 A	60.5	59.4	59.	1
25	30.12	29.83	29.997	79.	2 P	56.5	2 A	67.7	65.9	60.5	10
26	30.17	30.10	30.133	81.5	1 P	52.5	4 A	67.	69.8	63.5	13
27	30.10	29.89	29.970	81.5	3 P	63.5	4 A	72.5	70.7	68.5	3
28	30.11	29.91	30.067	88.	3 P	69.	12 P	78.5	75.6	70.	13
29	30.13	30.02	30.093	91.	3 P	61.5	3 A	76.2	75.9	71.2	13
30	30.02	29.82	29.860	86.5	3 P	67.5	5 A	77.0	75.5	71.3	8
31	30.19	29.82	30.060	77.	2 P	60.5	12 P	68.7	68.7	58.8	14

DAILY SUMMARY.

	HUMIDITY.			WIND.					PRECIPITATION.			
											TOTAL IN INCHES.	
DAY.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.*	SNOW.
1	59.	.918	58.	S.	137	2.	20	3 P				
2	63.	.930	65.	S.	203	4.	28	1 P				
3	62.3	.718	80.7	E.S.E.	158	8.5	41	1 P	1-20 P	1-55 P	0.61	
4	61.3	.616	89.7	S.E.	51	0.5	10	6 P	9 A	12 P	0.05	
5	65.3	.825	78.3	W.	109	3.	24	11 A	0 A	4-30 A	0.33	
6	65.3	.755	84.	S.E.	123	2.	20	3-30 P	6 P		T.	
7	63.3	.670	89.3	E.N.E.	73	4.75	31	4 P	1 P	4 P	1.14	
8	59.	.701	74.7	S.	72	0.5	10	7 P	9 P		T.	
9	69.3	.876	83.3	S.	102	2.5	22	8 P	11 P		T.	
10	64.	.986	67.	S.S.W.	218	3.	24	4-30 P				
11	64.	.952	64.7	S.S.W.	195	6.5	36	12-30 P				
12	59.7	1.042	52.3	S.S.W.	124	2.5	22	2 P				
13	65.7	.978	68.	S.S.W.	133	3.5	26	1 P	3 P	4 P	T.	
14	66.7	.888	75.3	N.E.	38	0.5	10	12 P	9-30 A		T.	
15	69.	.816	88.	S.	101	2.5	22	4 P	6-15 A	9-30 P	0.56	
16	52.	.911	58.3	N.W.	133	1.5	17	4-30 P	A		T.	
17	53.	.957	63.7	N.	104	2.	20	10 A				
18	55.	.723	64.3	S.	85	0.5	10	4-30 P				
19	58.	.756	67.	S.W.	93	1.	14	2 P				
20	67.3	.743	90.3	S.S.W.	256	5.	32	2 P	12 M	12 P	0.45	
21	71.3	.986	80.7	S.W.	170	0.75	12	4-30 P	0 A	5 A	0.42	
22	71.3	.905	85.7	S.S.E.	103	1.	14	1-30 P				
23	60.7	.780	71.	S.W.	197	4.5	30	6 P	0 A	4 A	0.14	
24	56.7	.563	82.7	S.S.W.	79	3.5	26	1 P	12 M	12 P	0.48	
25	55.7	.689	69.3	N.N.W.	163	4.75	31	11 A	0 A	6 A	0.07	
26	58.	.808	63.7	S.S.W.	110	2.	20	2 P				
27	66.3	.809	81.7	S.	233	3.	24	2 P	8 A	12 P	0.04	
28	66.7	.950	69.3	S.E.	57	2.25	21	6 P	P		T.	
29	67.	1.034	69.0	S.S.W.	40	1.	14	8 P				
30	68.3	.957	76.	S.	165	1.	14	7 A	2 A	9-15 P	0.67	
31	50.7	.715	54.7	N.	223	6.	35	10 A				

*At base of tower. T=trace.

REMARKS.

The weather conditions of the past month have been unusually favorable to the growth of all kinds of vegetation. The month was somewhat more windy and hotter than usual; but while the mean temperature was nearly two degrees above normal the rainfall was abundant and well distributed, so the crops are in excellent condition and pastures and lawns are unusually green for the season.

The hay crop, which has been harvested, proved heavier than was anticipated early in the season, in consequence of the abundant rainfall of the month. There is moreover an excellent prospect of a good crop of rowen in fields from which the hay was cut early in the season, except in the few cases where the army worm fed upon the new growth as it started. Tobacco has been topped in most fields and is growing rapidly.

It will be noticed that certain changes have been made in the bulletin for this month. The temperature readings in the observatory tower will not be published henceforth as it is believed that the variation in the tower and ground readings is, at times, as much due to difference in exposure as to difference in elevation. All temperature observations, therefore, which are published, are taken in the old ground-shelter, which stands on the side of the campus, several hundred feet from any buildings or large trees. The mean daily temperature, as figured from the maximum and minimum temperature readings, is also given, as is the daily mean sensible temperature, (being the mean of the 7 A. M., 2 P. M., and 9 P. M. wet-bulb thermometer readings).

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude. 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 92. **AUGUST, 1896.**

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.11, 29th, 7 A.
Actual min. reading,	29.52, 2nd, 8 A.
Reduced maximum reading,	30.39, 29th, 7 A.
Reduced min. reading,	29.80, 2nd, 8 P.
Mean reduced to sea level,	30.106
Monthly range,	0.59

****Air Temperature.*** In Degrees Fahr.

Highest,	97.0; 12th
Lowest,	42.0; 20th, 29th
Mean,	68.2
Mean of means of max. and min.,	68.8
Mean sensible (wet bulb),	64.5
Monthly Range,	55.0
Highest mean daily,	80.0, 10th
Lowest mean daily,	56.3, 19th
Mean maximum,	80.5
Mean minimum,	57.2
Mean daily range,	23.3
Greatest daily range,	34.5, 20th
Least daily range,	10.0, 14th

Humidity.

Mean dew point,	61.7
Mean force of vapor,	0.749
Mean relative humidity,	79.9

Wind.

Prevailing Direction, southwest.

Summary.

South, Southwest,	23 per cent.
Southwest,	16 " "
South,	16 " "
West South West,	10 " "
Other directions,	35 " "

Total movement,	2968 m.
Greatest daily movement,	183 m., 16th
Least daily movement,	40 m., 12th
Mean daily movement,	95.7 m.
Mean hourly velocity,	4 m.
Maximum pressure per square foot,	12.5 lbs. =50 m. per hour, 26th, 11.30 A. M.

Precipitation. In inches.

Total precipitation,	3.84
Number of days on which .01 inch or more rain fell,	11

Weather.

Mean cloudiness observed,	40 per cent.
Total cloudiness recorded by the Sun Thermometer,	174 hours or 41 per cent.
Number of clear days,	13
Number of fair days,	10
Number of cloudy days,	8

Bright Sunshine.

Number of Hours recorded, 254 hours or 59%

Rain, 1st, 2nd, 5th, 6th, 9th, 10th, 12th, 13th, 14th, 16th, 18th, 21st, 22d, 23d, 27th, 31st.

Gales, of 35 or more miles per hour, 50 m., 26th, S.S.W.

Thunder and Lightning, 2d, 5th, 6th, 7th, 9th, 10th, 12th, 14th.

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* Temperature in ground shelter.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.& MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.29	30.07	30.187	74.5	3 P	46.5	5 A	60.5	63.1	57.7	14
2	30.07	29.80	29.870	78.5	5 P	59.	12 P	68.7	65.4	63.3	4
3	30.09	29.99	30.080	81.5	2 P	54.	5 A	67.7	68.4	64.8	13
4	30.10	30.01	30.050	87.	2 P	62.	4 A	74.5	75.2	71.	14
5	30.18	30.00	30.060	91.	4 P	66.	12 P	78.5	77.5	72.	14
6	30.22	30.09	30.187	77.5	3 P	62.5	4 A	70.	69.2	67.8	0
7	30.15	30.02	30.087	89.5	4 P	64.	1 A	76.7	76.	72.8	5
8	30.10	30.02	30.060	92.	4 P	66.	5 A	79.	77.8	71.7	14
9	30.07	29.95	30.013	91.	3 P	63.	5 A	77.	77.1	73.7	10
10	30.06	29.99	30.040	91.5	1 P	69.	5 A	80.3	80.	75.3	7
11	30.08	30.04	30.077	92.5	3 P	67.	5 A	79.7	79.4	74.8	12
12	30.13	30.07	30.107	97.	4 P	67.	5 A	82.	79.7	74.3	12
13	30.15	30.10	30.127	88.5	3 P	68.5	5 A	78.5	77.9	72.7	7
14	30.19	30.12	30.157	76.	5 P	66.	12 P	71.	69.4	68.5	0
15	30.27	30.19	30.233	82.	5 P	63.5	0 A	72.7	71.3	68.8	8
16	30.20	29.96	30.057	78.5	2 P	67.	0 A	72.7	71 5	68.7	2
17	30.07	29.96	30.030	76.5	1 P	57.	12 P	66.7	66.7	58.	10
18	30.07	29.99	30.047	75.	1 P	48.5	4 A	61.7	58.4	55.7	7
19	30.29	30.07	30.193	69.5	5 P	45.	5 A	57.2	56.3	52.3	7
20	30.32	30.22	30.277	76.5	5 P	42.	5 A	59.2	59.6	55.5	13
21	30.24	30.11	30.140	75.	2 P	45.	5 A	60.	61.1	58.3	6
22	30.13	30.07	30.163	73.5	4 P	58.	4 A	65.7	65.8	64.7	1
23	30.10	29.98	30.020	75.5	5 P	63.5	0 A	69.5	69.3	69.	0
24	30.07	30.01	30.043	81.	1 P	65.	12 P	73.	69.7	64.2	10
25	30.18	30.07	30.127	81.	4 P	53.	4 A	67.	66.0	60.8	12
26	30.25	30.16	30.200	80.	3 P	50.	5 A	65.	65.1	59.5	11
27	30.25	30.09	30.153	74.5	5 P	53.	0 A	63.7	61.2	59.2	4
28	30.36	30.25	30.330	75.	3 P	43.	5 A	59.	59.5	54 5	11
29	30.39	30.21	30.313	74.	3 P	42.	6 A	58.	59.5	55.5	13
30	30.21	29.90	30.017	75.	3 P	46.	5 A	60.5	61.5	57.	11
31	30.02	29.83	29.893	65.	5 P	50.5	12 P	57.7	56.7	57.3	2

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES.	
											RAIN.*	SNOW.
1	50.7	.662	58.3	S.	113	4.5	30	3 P	9-30 P	12 P	0.02	
2	61.3	.637	89.	W.S.W.	128	2.	20	3 P	0 A	10-30 A	0.80	
3	61.7	.748	80.7	S.S.W.	53	0.5	10	2 P				
4	69.	.942	77.3	S.S.W.	172	3.25	25	1-30 P				
5	70.	.977	78.7	S.S.E.	103	5.5	33	8 P	11 P	12 P	0.35	
6	66.7	.737	90.7	S.W.	93	5.5	33	9 P	8 P	12 P	0.30	
7	70.7	.953	82.3	S.S.W.	115	1.5	17	8-30 P				
8	69.	1.008	77.	W.S.W.	45	0.5	10	6 P				
9	72.	1.002	81.7	S.W.	73	4.5	30	4-30 P	5-30 P		T.	
10	72.7	1.081	77.	W.S.W.	73	2.	20	1-30 P	7-30 P		T.	
11	72.	1.084	77.	W.N.W	42	——	—	——				
12	71.3	1.097	76.	N.N.W.	40	1.	14	9-30 P	7-30 P		T.	
13	70.3	.984	76.7	N.	103	0.5	10	3 P				
14	68.	.712	97.	N.N.W.	72	0.75	12	3 A	0-30 A	1-30 P	0.96	
15	67.3	.791	87.	S.W.	44	1.	14	9 P				
16	67.	.780	87.0	S.S.W.	183	4.	28	2 P	6-45 P	10 P	0.20	
17	52.7	.639	62.7	W.N.W	139	3.	24	12 M				
18	52.3	.516	79.	S.S.W.	72	2.	20	1-30 P	1-45 P	4 P	0.03	
19	49.	.476	79.	N.	111	5.5	33	1 P				
20	51.7	.557	76.	S.S.W.	49	——	—	——				
21	55.3	.588	80.	S.	97	1.	14	1 P	6-30 P	12 P	0.03	
22	63.	.665	89.	S.	181	3.5	26	12 M	8 P		T.	
23	68.3	.743	93.7	S	158	1.	14	2 P	9-30 A	12 P	0.55	
24	61.3	.742	77.7	S.W.	73	——	—	——				
25	55.7	.714	66.3	E.	75	——	—	——				
26	55.	.679	70.	S.	115	12.5	50	11-30 A				
27	56.7	.563	84.3	N.N.E.	52	——	—	——	8-30 A	11 A	0.15	
28	50.	.538	73.6	N.W.	86	1.	14	10 A				
29	51.3	.565	73.	S.S.W.	59	0.75	12	2 P				
30	54.3	.569	80.3	S.S.E.	127	2.	20	4 P				
31	57.	.477	98.	S.W.	122	0.5	10	1-30 A	8 A	4 P	0.45	

*At base of tower. T=trace.

REMARKS.

" August has been a very favorable month from an agricultural point of view. It opened with plenty of heat, sunshine and moisture, and with all crops pushing ahead fast, except the potato vines which were considerably blighted in the south by the excessive moisture and humidity. Unusually hot and sultry weather continued over the second week of the month so that cabbages and cranberries were considerably damaged, though corn, tobacco, and similar crops made very rapid growth."—*N. E. Weather Bureau.*

This hot wave, from the 3rd to the 13th instant was the most trying that we have had, since July 1892, and was much more protracted than the latter. The long lists of deaths, resulting from the heat, in our large cities, published daily in the newspapers, during the latter part of this hot spell, bore witness to its intensity.

The last half of the month has been considerably cooler and drier, with plenty of sunshine. Corn has continued to grow well and the tobacco crop, now well under cover, is a fine one, notably so, owing to the very favorable season and absence of violent storms. Pasture lands are in excellent condition and a good crop of rowen has been cut from many of the earlier fields.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 93. SEPTEMBER, 1896.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.13, 25th, 9 A.
Actual min. reading,	29.27, 19th, 5 P.
Reduced maximum reading,	30.41, 25th, 9 A.
Reduced min. reading,	29.55, 19th, 5 P.
Mean reduced to sea level,	30.099
Monthly range,	0.86

**Air Temperature.* In Degrees Fahr.

Highest,	88.5; 11th
Lowest,	31., 24th
Mean,	59.3
Mean of means of max. and min.,	59.5
Mean sensible (wet bulb),	56.9
Monthly Range,	57.5
Highest mean daily,	75.4, 11th
Lowest mean daily,	43.6, 23d
Mean maximum,	70.3
Mean minimum,	48.8
Mean daily range,	21.5
Greatest daily range,	33.5, 2d, 25th
Least daily range,	10., 17th, 22d

Humidity.

Mean dew point,	54.5
Mean force of vapor,	.543
Mean relative humidity,	84.0

Wind.

Prevailing Direction, west, southwest.

Summary.

North,	13 per cent.
West,	10 " "
South,	20 " "
West South West,	10 " "
Other directions,	47 " "

Total movement,	4686 m.
Greatest daily movement,	355 m., 10th
Least daily movement,	50 m., 7th
Mean daily movement,	156.2 m.
Mean hourly velocity,	6.5 m.
Maximum pressure per square foot, 16 lbs. = 57 m. per hour, 19th 5 P.	

Precipitation. In Inches.

Total precipitation,	5.41
Number of days on which .01 inch or more rain fell,	10

Weather.

Mean cloudiness observed,	52 per cent.
Total cloudiness recorded by the Sun Thermometer,	184 hours or 49 per cent.
Number of clear days,	9
Number of fair days,	8
Number of cloudy days,	13

Bright Sunshine.

Number of Hours recorded, 189 hours or 51 %

Rain, 3d, 5th, 6th, 9th, 10th, 12th, 17th, 18th, 19th, 22d, 28th, 29th, 30th.

Gales, of 35 or more miles per hour, 44m., 3d, S.S.W.; 37m., 9th, N.N.E.; 39m., 10th, N.N.W.; 57m., 19th, S.W.; 37m. 22d, N.; 37m., 23d, N.; 37m., 30th, S.S.W.

Thunder and Lightning, 3d, 6th, 17th, 19th.

First Frost on ground, 21st.
" " in shelter, 24th.

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* Temperature in ground shelter.

DAILY SUMMARY.

	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							
DAY.	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.&MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	NUMBER OF HOURS BRIGHT SUNSHINE.
1	30.36	30.02	30.210	67.	4 P	43.5	12 P	55.2	54.4	51.2	13
2	30.41	30.22	30.320	70.	4 P	36.5	6 A	53.2	55.2	50.7	11
3	30.22	29.78	29.960	76.	3 P	57.	3 A	66.5	65.5	64.5	0
4	30.25	29.96	30.177	69.5	4 P	45.5	12 P	57.5	57.5	53.7	13
5	30.27	30.08	30.210	68.	2 P	39.	6 A	53.5	54.1	53.0	8
6	30.08	29.81	29.883	71.	3 P	51.	5 A	61.0	58.9	59.5	0
7	30.19	29.96	30.103	73.5	2 P	49.	6 A	61.2	59.1	56.0	10
8	30.28	30.19	30.253	72.	2 P	48.	5 A	60.0	59.2	56.7	12
9	30.23	29.91	30.050	68.5	2 P	50.	5 A	59.2	60.5	58.7	0
10	29.95	29.81	29.870	75.	4 P	60.5	2 A	67.7	67.0	62.5	0
11	30.19	29.95	30.100	88.5	3 P	59.	5 A	73.7	75.4	70.7	12
12	30.25	30.19	30.230	81.5	3 P	61.	6 A	71.2	71.3	68.5	9
13	30.37	30.22	30.340	69.	1 A	56.	12 P	62.5	63.5	58.0	0
14	30.33	30.07	30.163	71.	4 P	54.5	6 A	62.7	60.7	58.8	5
15	30.07	29.96	29.997	71.5	1 P	59.	5 A	65.2	64.8	62.8	4
16	30.03	29.95	29.993	74.5	4 P	51.	5 A	62.7	61 4	57.3	11
17	29.97	29.78	29.827	63.5	6 P	53.5	7 A	58.5	59.0	59.0	0
18	30.08	29.80	29.997	73.	4 P	51.5	6 A	62.2	62.0	56.0	11
19	30.08	29.55	29.730	75.	2 P	54.	8 A	64.5	61.9	60.3	0
20	30.15	29.72	30.060	63.	2 P	44.5	12 P	53.7	51.2	49.3	9
21	30.11	29.95	30.023	66.5	3 P	35.5	5 A	51.0	52.6	51.0	7
22	29.96	29.80	29.867	59.	2 P	49.	12 P	54.0	52.9	52.7	0
23	30.20	29.96	30.153	54.	2 P	35.	12 P	44.5	43.6	39.3	12
24	30.33	30.18	30.230	61.5	2 P	31.	2 A	46.2	46.6	45.7	4
25	30.41	30.33	30.383	70.	2 P	36.5	6 A	53.2	53.4	52.0	9
26	30.40	30.31	30.360	73.5	3 P	52.	5 A	62.7	62.0	60.2	11
27	30.33	30.18	30.233	75.	3 P	53.	5 A	64.0	63.7	61.5	9
28	30.33	30.16	30.280	62.	1 P	51.5	12 P	56.7	56.9	54.2	0
29	30.34	30.02	30.223	70.5	3 P	46.0	5 A	58.2	56.9	56.2	0
30	30.02	29.70	29.743	75.0	3 P	49.5	0 A	62.2	66.5	66.3	9

DAILY SUMMARY.

	HUMIDITY.			WIND.					PRECIPITATION.			
											TOTAL IN INCHES.	
DAY.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.*	SNOW.
1	47.7	.447	79.3	S.S.W.	107	3.5	26	12 M				
2	47.3	.469	77.0	S.	125	3.5	26	4 P				
3	63.0	.673	87.3	S.S.W.	240	9.5	44	6 P	6 P	9 P	0.16	
4	51.0	.489	80.0	N.N.W	136	2.	20	3 A				
5	50.3	.474	82.0	S.E.	128	1.75	19	6 P	7 P	12 P	0.46	
6	59.3	.523	97.3	N.N.W.	116	5.	32	4 P	0 A	6 P	2.16	
7	53.7	.523	85.3	W.N.W	50	0.5	10	2 P				
8	53.3	.553	78.0	N.	106	0.5	10	9 A				
9	56.0	.560	83.7	N.	264	7.	37	12-30 M	10 P	12 P	0.13	
10	59.0	.683	76.7	N.N.E.	355	7.5	39	1-30 A	0 A	6 A	0.02	
11	68.3	.931	79.3	S.	124	0.5	10	8 P				
12	67.0	.775	88.3	S.W.	56	0.	0	———	5-15 P		T.	
13	55.0	.573	77.3	N.N.E.	212	2.	20	9 A				
14	57.0	.551	86.0	W.S.W.	110	1.5	17	3-30 P				
15	61.7	.617	89.7	W.S.W.	104	4.5	30	1-30 P				
16	54.3	.571	77.7	W.	142	0.5	10	7 P				
17	58.7	.509	98.3	S.S.E.	160	1.5	17	9 P	6 A	9 P	0.53	
18	51.0	.571	68.7	W.	126	3.	24	11 A	10 P		T.	
19	59.0	.576	89.7	W.S.W.	124	16.	57	5 P	0 A	7 P	1.25	
20	45.3	.416	77.7	W.N.W	162	4.5	30	0 A				
21	48.7	.438	83.7	S.	90	1.5	17	11-30 A				
22	51.7	.412	94.3	W.	149	7.	37	11-30 P	6 A	7 P	0.16	
23	34.0	.290	72.7	N.	313	7.	37	0-30 A				
24	43.3	.353	84.	S.W.	74	0.	0	———				
25	50.0	.454	87.7	S	119	4.5	30	3 P				
26	58.3	.604	83.7	S.	236	4.5	30	12 M				
27	60.0	.620	86.3	S.	223	4.5	30	4 P				
28	52.7	.454	88.7	N.	145	4.5	30	6-30 A	9 A		T.	
29	55.0	.497	89.7	E.N.E.	68	1.	15	4-30 P	11 P	12 P	0.04	
30	65.0	.698	91.0	S.S.E.	322	7.	37	3 P	0 A	6-30 A	0.50	

*At base of tower. T=trace.

REMARKS.

The New England Weather Bureau reports, for the past month, that "rain has been frequent and excessive in all districts. Crops have ripened pretty well, but the weather has been unfavorable for curing corn and grain and for harvesting the second crop. The ground is well filled with water at the end of the month and wells and springs are filling up fast. The weather has been exceptionally favorable for the growth of late forage crops and for pastures and newly seeded fields. Stock will come to the barns in unusually good condition from most pastures. The conditions have been unfavorable however for potatoes, and rust and decay have increased over most of the state. Fruit has been shaken from the trees comparatively little by wind storms.

Local rain and thunderstorms have been as frequent and damaging as during any month this season. They were especially severe on the 5th—6th, 9th—10th, and 19th instants.

Tobacco was secured remarkably from damage by the weather and is reported to be curing well."

At Amherst the precipitation was about an inch and a half in excess of the normal amount, and the mean temperature for the month was about two degrees below normal. The first frost of the season in the ground shelter was on the 24th instant, when the temperature fell to 31° F., and a light frost was noted in the lowlands on the 21st instant. Neither of them however did serious damage.

The corn crop, which matured late, is reported as abundant and good, and rowen exceptionally good. The onion crop is poor and light owing to the early winds and blight, and potatoes are suffering from rot and rust to some extent. Apples and grapes are both abundant and fine.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 94. OCTOBER, 1896.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.40, 10th, 9 A.
Actual min. reading,	29.32, 24th, 1 P.
Reduced maximum reading,	30.68, 10th, 9 A.
Reduced min. reading,	29.60, 24th, 1 P.
Mean reduced to sea level,	30.094
Monthly range,	1.08

**Air Temperature.* In Degrees Fahr.

Highest,	72.0; 31st
Lowest,	23., 26th
Mean,	46.4
Mean of means of max. and min.,	47.1
Mean sensible (wet bulb),	44.9
Monthly Range,	49.0
Highest mean daily,	60.8, 31st
Lowest mean daily,	36.4, 23d
Mean maximum,	55.9
Mean minimum,	38.1
Mean daily range,	17.8
Greatest daily range,	37.5, 27th
Least daily range,	3., 5th

Humidity.

Mean dew point,	42.4
Mean force of vapor,	.339
Mean relative humidity,	85.1

Wind.

Prevailing Direction, west.

Summary.

North,	13 per cent.
West,	13 " "
South,	10 " "
South West,	19 " "
South South West,	10 " "
Other directions,	35 " "

Total movement,	4544 m.
Greatest daily movement,	455 m., 12th
Least daily movement,	20 m., 23d
Mean daily movement,	146.6 m.
Mean hourly velocity,	6.1 m.

Maximum pressure per square foot, 12 lbs. = 49 m. per hour, 12th 11 A. N.E.

Precipitation. In inches.

Total precipitation,	3.23
Number of days on which .01 inch or more rain fell,	13

Weather.

Mean cloudiness observed,	63 per cent.
Total cloudiness recorded by the Sun Thermometer,	226 hours or 66 per cent.
Number of clear days,	7
Number of fair days,	5
Number of cloudy days,	19

Bright Sunshine.

Number of Hours recorded, 115 hours or 34 %

Rain, 1st, 2d, 4th, 5th, 6th, 7th, 12th, 13th, 14th, 15th, 17th, 18th, 21st, 23d, 24th, 29th, 30th, 31st.

Gales, of 35 or more miles per hour, 39m., 11th, N.E.; 49m., 12th, N.E.; 36m., 19th, W.N.W.; 39m., 20th, S.S.W.; 37m. 21st, S.S.W.

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* Temperature in ground shelter.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX. & MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	29.97	29.77	29.903	66.0	1 P	55.5	12 P	60.7	59.1	54.7	3
2	30.09	29.96	30.037	55.5	1 A	50.5	12 P	53.0	53.2	50.5	0
3	30.26	30.09	30.203	62.	3 P	48.	4 A	55.0	53.2	51.8	3
4	30.30	30.24	30.270	56.	2 P	41.	5 A	48.5	49.4	48.7	0
5	30.24	30.20	30.217	50.	2 P	47.	12 P	48.5	47.4	47.5	0
6	30.20	30.09	30.137	59.	2 P	45.5	4 A	52.2	49.3	48.2	1
7	30.09	29.94	29.990	57.5	3 P	43.5	5 A	50.5	47.9	47.2	3
8	30.40	30.05	30.223	49.5	2 P	38.5	12 P	44.0	44.2	42.0	6
9	30.64	30.40	30.537	55.	4 P	28.5	5 A	41.7	40.1	37.7	10
10	30.68	30.55	30.620	58.	3 P	26.5	5 A	42.2	41.6	39.3	11
11	30.60	30.31	30.453	50.5	2 P	32.5	5 A	41.5	43.4	42.7	0
12	30.31	30.12	30.183	55.	2 P	45.5	6 A	50.2	49.0	46.5	1
13	30.12	29.81	29.917	53.	7 P	44.	4 A	48.5	46.2	46.5	0
14	29.81	29.71	29.743	56.	2 P	46.	4 A	51.0	49.3	48.8	0
15	29.75	29.67	29.707	57.5	2 P	43.	12 P	50.2	49.8	46.5	0
16	29.88	29.67	29.737	60.	2 P	30.	6 A	45.0	45 2	43.2	5
17	30.04	29.88	29.990	50.	2 P	34.5	5 A	42.3	42.2	40.2	1
18	30.04	29.85	29.920	46.	2 P	40.	5 A	43.0	43.0	42.7	0
19	30.23	29.93	30.110	48.	2 P	30.	12 P	39.0	38.9	34.5	10
20	30.24	30.07	30.127	54.	4 P	25.	3 A	39.5	41.6	42.8	0
21	30.12	29.86	29.957	59.	2 P	41.5	12 P	50.2	50.5	48.7	0
22	30.13	30.01	30.087	50.	2 P	30.	12 P	40.0	38.2	35.7	7
23	30.13	29.68	29.900	50.	4 P	24.	5 A	37.0	36.4	37.3	2
24	29.88	29.60	29.683	54.5	12 M	38.	12 P	46.2	44.5	41.8	7
25	30.23	29.88	30.107	45.5	1 P	33.	12 P	39.2	38.5	36.2	10
26	30.26	30.11	30.180	56.	3 P	23.	5 A	39.5	40.0	39.5	9
27	30.37	30.17	30.277	66.	2 P	28.5	7 A	47.2	45.2	42.5	9
28	30.51	30.37	30.483	57.5	2 P	33.	5 A	45.2	44.3	43.7	8
29	30.48	30.20	30.290	61.5	2 P	41.5	1 A	51.5	52.3	53.2	0
30	30.20	29.92	30.037	63.	6 P	45.5	4 A	54.2	55.1	55.5	0
31	29.97	29.86	29.903	72.	3 P	48.	12 P	60.0	60.8	56.5	9

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
											TOTAL IN INCHES.	
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.*	SNOW.
1	51.7	.489	79.7	S.W.	124	2.5	22	11-30 P	0 A	5-30 A	0.02	
2	48.0	.403	84.7	N.N.W	210	3.	24	8 A	2-30 P	7 P	T.	
3	49.3	.426	85.3	W.	65	0.	—	——				
4	47.7	.361	91.7	N.	122	1.	14	10 A	12 M	12 P	0.54	
5	46.3	.339	94.5	N.	140	0.	—	——	0 A	12 P	0.35	
6	46.3	.368	86.3	N.E.	90	0.	—	——	0 A	9 P	0.07	
7	45.0	.357	84.7	S.W.	105	2.	20	4 P	6 A	11-30 A	0.08	
8	39.3	.293	83.3	W.N.W	182	3.5	26	4 P				
9	34.0	.265	81.0	W.	83	0.5	10	1-30 P				
10	35.7	.290	79.0	N.	99	0.	—	——				
11	40.3	.303	84.0	N.N.E.	242	7.5	39	5 P				
12	42.3	.371	73.7	N.E.	455	12.	49	11 A			T.	
13	46.3	.318	98.7	N.	278	5.5	33	0 A	7 A	7 P	0.92	
14	47.0	.372	88.0	N.N.E.	191	2.5	22	7-30 P	6 P	12 P	T.	
15	43.7	.359	83.0	N.W.	183	3.5	26	8-30 A	0 A	4 P	0.20	
16	40.7	.331	84.7	S.	77	2.5	22	9 P				
17	37.7	.271	85.0	S.W.	63	0.	—	——	3 P	12 P	0.10	
18	41.7	.280	94.7	N.N.W.	130	0.75	12	10-30 P	0 A	8 P	0.21	
19	30.0	.230	77.0	W.	206	6.5	36	11 A				
20	40.0	.316	85.7	S.S.W.	136	7.5	39	6 P				
21	46.3	.377	86.3	S.	207	7.	37	6 P	5 A	1 P	0.18	
22	32.0	.236	80.0	S.S.W.	108	4.5	30	2 P				
23	36.3	.238	95.0	S.S.W.	20	0.	—	——	6 P	12 P	0.25	
24	37.7	.303	78.	N.W.	156	4.5	30	3 P	0 A	6 A	0.29	
25	31.3	.243	74.0	W.	211	4.5	30	1-30 P				
26	36.7	.286	82.3	S.S.E.	116	3.5	26	1-30 P				
27	39.7	.348	83.7	S.W.	68	0.	—	——				
28	41.7	.322	84.7	S.W.	72	1.5	18	7 P				
29	51.7	.438	90.3	S.S.E.	172	1.5	18	4 P			T	
30	54.7	.466	93.7	S.	82	1.75	19	7 P	A		T.	
31	54.7	.524	87.	S W.	151	2.	20	12-30 M	4 A	6 A	0.02	

*At base of tower. T=trace.

REMARKS.

October, usually the most charming month of the fall in the country, has been a great disappointment in this vicinity this year. Instead of the fine display of autumn foliage to which everything seemed to point earlier in the season, we have had a cheerless and stormy month with very few of the customary bright and bracing autumn days. We have had but 34% of the possible sunshine, the smallest amount on record for October at this station,—the lowest previous record being 42% in 1895.

The mean temperature of the month was nearly 3° below normal, while the mean relative humidity was exceptionally high.

In spite of the large amount of stormy weather, however, the rainfall was an inch below normal.

" A number of severe storms have passed near enough to us to give cloudy and threatening weather and some wind, but not near enough for us to get the worst part of the disturbances. The most noteworthy was the West Indies hurricane of the 12th. to 16th. This was first noted over the West Indies on the 7th. and moved slowly up the coast, well out to sea. Storm signals were ordered and displayed all along our coasts, giving ample warning of the gale. The wind reached hurricane force on our extreme eastern coast, while the center of the storm was several hundred miles out to sea." (J. Warren Smith, N. E. Weather Bureau.)

The month has been generally unfavorable for fall farming operations. Corn has not cured well and tobacco is reported as rotting to some extent owing to the excessive dampness. Fall seeding and grains have made an excellent catch, however, and pastures are in fine condition.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 260 ft.

BULLETIN No. 95. **NOVEMBER, 1896.**

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.58, 23d, 10 A.
Actual min. reading,	29.36, 5th, 11 P.
Reduced maximum reading,	30.86, 23d, 10 A.
Reduced min. reading,	29.63, 5th, 11 P.
Mean reduced to sea level,	30.233
Monthly range,	1.23

**Air Temperature.* In Degrees Fahr.

Highest,	69.0; 17th
Lowest,	15., 23d
Mean,	41.9
Mean of means of max. and min.,	42.2
Mean sensible(wet bulb),	40.4
Monthly Range,	54.0
Highest mean daily,	58.5, 27th
Lowest mean daily,	26.4, 21st
Mean maximum,	51.6
Mean minimum,	32.8
Mean daily range,	18.8
Greatest daily range,	32.5, 2nd
Least daily range,	7., 18th,20th

Humidity.

Mean dew point,	37.7
Mean force of vapor,	.292
Mean relative humidity,	82.3

Wind.

Prevailing Direction. west south west.

Summary.

West,	10 per cent.
North West,	10 " "
West North West,	13 " "
West South West,	10 " "
South South West,	13 " "
South South East,	10 " "
Other directions,	34 " "

Total movement,	4654 m.
Greatest daily movement,	331 m., 5th
Least daily movement,	19 m., 1st, 26th
Mean daily movement,	155.1 m.
Mean hourly velocity,	6.5 m.

Maximum pressure per square foot, 15 lbs.= 55 m. per hour, 6th 1-30 P. West.

Precipitation. In inches.

Total precipitation,	3.03
Number of days on which .01 inch or more rain fell,	10
Snow total in inches,	1.75

Weather.

Mean cloudiness observed,	59 per cent.
Total cloudiness recorded by the Sun Thermometer,	188 hours or 64 per cent.
Number of clear days,	6
Number of fair days,	5
Number of cloudy days,	19

Bright Sunshine.

Number of Hours recorded, 105 hours or 36%

Rain, 4th, 5th, 8th, 11th, 12th, 14th, 21st, 24th, 25th, 26th, 27th, 28th, 29th.

Gales, of 35 or more miles per hour, 45m., 5th, S.; 55m., 6th, W.; 40m., 11th, S.S.W.; 36m., 27th, S.W.

Snow, ... 14th, 21st, 29th.

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* Temperature in ground shelter.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.& MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.15	29.96	30.070	55.	2 P	40.	12 P	47.5	46.2	45.2	0
2	30.37	30.15	30.230	61.5	1 P	29.	6 A	45.2	44.7	42.3	10
3	30.46	30.37	30.433	59.	2 P	29.	6 A	44.0	41.8	39.5	10
4	30.50	30.26	30.397	57.	2 P	34.	2 A	45.5	45.	44.8	0
5	30.26	29.63	29.820	64.	5 P	45.	4 A	54.5	56.2	58.5	0
6	29.99	29.65	29.860	52.5	1 P	45.	7 A	48.7	49.5	43.5	4
7	30.03	29.94	29.983	60.	3 P	38.	7 A	49.0	48.4	44.8	10
8	29.96	29.86	29.890	52.	1 P	42.	12 P	47.0	45.7	44.7	0
9	30.26	29.91	30.067	47.	12 M	30.	12 P	38.5	36.9	33.5	8
10	30.45	30.26	30.390	49.5	2 P	25.	4 A	37.2	36.1	35.2	10
11	30.40	29.95	30.087	57.	2 P	31.5	1 A	44.2	45.0	47.2	0
12	30.15	30.08	30.100	48.5	2 P	36.	12 P	42.2	43.0	40.5	0
13	30.10	29.86	29.920	44.	1 P	25.	7 A	34.5	34.6	32.5	5
14	30.31	29.90	30.197	36.	2 P	24.5	11 P	30.2	30.5	27.7	8
15	30.27	30.05	30.110	50.5	3 P	22.5	1 A	36.5	39.2	38.0	1
16	30.27	30.19	30.230	62.	3 P	36.	3 A	49.0	48.0	46.3	6
17	30.28	30.14	30.200	69.	2 P	42.	6 A	55.5	55.6	54.2	5
18	30.35	30.02	30.223	51.	4 A	44.	7 P	47.5	48.8	46.5	0
19	30.45	29.95	30.180	55.	9 A	34.	12 P	44.5	45.4	42.0	2
20	30.65	30.45	30.607	30.5	2 P	23.5	7 A	27.	26.9	23.7	3
21	30.62	30.04	30.307	39.	12 P	22.	5 A	30.5	26.4	26.0	0
22	30.78	30.04	30.483	39.	2 P	28.	12 P	33.5	32.9	31.7	4
23	30.86	30.57	30.770	47.	10 P	15.	6 A	31.0	28.1	28.0	4
24	30.57	30.35	30.420	57.5	2 P	35.	1 A	46.2	46.4	46.5	2
25	30.66	30.53	30.587	42.5	2 P	30.	7 A	36.2	37.5	36.3	2
26	30.53	30.21	30.353	57.	12 P	37.	6 A	47.	41.7	41.7	0
27	30.21	30.12	30.140	67.	2 P	43.5	2 A	55.2	58.5	58.2	5
28	30.26	30.06	30.143	64.	10 A	43.	12 P	53.5	53.4	50.8	0
29	30.44	30.26	30.393	42.	2 P	30.5	12 P	36.2	36.4	34.7	5
30	30.42	30.34	30.390	31.	12 M	23.5	12 P	27.2	27.8	27.2	1

DAILY SUMMARY.

DAY.	HUMIDITY.			WIND.					PRECIPITATION.			
	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	TOTAL IN INCHES. RAIN.*	SNOW.
1	44.3	.320	93.3	S.S.W.	19	0.	0	—				
2	40.0	.321	87.0	W.	125	6.	34	10-30 A				
3	34.7	.301	77.3	S.S.W.	32	0.	0	—				
4	42.3	.330	84.3	S.E.	142	1.	14	3 P	6-30 P	12 P	0.23	
5	58.0	.503	96.0	S.S.E.	331	10.	45	6 P	0 A	12 P	1.14	
6	38.3	.333	70.7	W.	285	15.	55	1-30 P				
7	41.3	.341	78.7	S.W.	194	2.	20	9 A				
8	43.3	.310	91.7	N.W.	106	1.	14	1-30 P	8 A	4 P	0.01	
9	30.3	.212	83.3	W.N.W	122	2.5	23	1 P				
10	31.7	.238	80.0	S.S.E.	104	1.	14	1 P				
11	46.0	.345	94.0	S.S.W.	129	8.	40	1-30 P	12 M	6 P	0.12	
12	38.0	.274	84.7	W.	79	0.5	10	1 P				
13	30.0	.201	87.0	N.W.	86	0.5	10	2 P	4-30 P		T.	
14	22.7	.168	77.3	W.N.W	258	4.	28	9 A	6-30 A			T.
15	32.3	.275	70.0	S.S.W.	244	5.5	33	5-30 A				
16	42.0	.380	75.3	S.S.E.	166	1.	14	8 P				
17	51.7	.494	81.5	S.	178	2.	20	1 P				
18	44.0	.347	83.3	E.S.E.	125	3.	24	12 P				
19	39.3	.298	83.7	W.S.W.	269	5.	32	9 A				
20	18.0	.142	73.0	N.	211	3.	24	11 A				
21	25.0	.144	95.7	N.W.	44	0.	0	—	8-45 A	9 P	0.30	0.25
22	27.7	.196	79.3	N.	170	5.	32	11 A				
23	25.3	.170	86.0	W.S W.	131	2.75	23	12-30 M				
24	44.3	.348	86.3	W.S W.	243	4.	28	2 P	4 A	8 A	0.04	
25	35.7	.222	94.7	N.E.	42	0.	0	—	11 A	12 P	0.10	
26	41.7	.264	100.	W.N.W	19	1.	14	11 P	0 A	12 P	0.47	
27	57.0	.521	91.3	S.	328	6.5	36	1 P	A		T.	
28	49.3	.400	91.0	W.N.W	250	3.5	26	2 A	10-40 A	12 P	0.50	
29	32.3	.215	87.7	N.N.W.	148	0.5	10	2 P	8 P	12 P	0.12	1.50
30	25.3	.151	94.7	N.N.W.	74	0.5	10	10-30 A				

*At base of tower. T=trace.

REMARKS.

The weather of the past month has been justly characterized as unseasonable.

The mean daily temperature for the month was nearly 4.5° above normal, that of the first three weeks being, with four exceptions, considerably above the mean, while the last ten days witnessed the passage of two marked anticyclones which brought with them more seasonable weather.

Though the precipitation shows a deficiency of nearly one inch, the mean relative humidity and percentage of cloudiness have been very high, as has the mean barometric pressure, the latter chiefly in consequence of the unusually high pressures accompanying the anticyclone of the 20th. to 24th. instants.

The first trace of snow of the season fell on the 14th. inst.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude, 72° 31′ 10″ W.
Height of instruments above ground, 51 ft. Above sea level, 273.5 ft. **

BULLETIN No. 96. DECEMBER, 1896.

MONTHLY SUMMARY.

Pressure. In inches.

Actual maximum reading,	30.60, 27th, 12 P.
Actual min. reading,	29.06, 9th, 10 A.
Reduced† maximum reading,	30.94, 27th, 12 P.
Reduced† min. reading,	29.37, 9th, 10 A.
Mean reduced†,	30.135
Monthly range,	1.57

****Air Temperature.*** In Degrees Fahr.

Highest,	52.5; 13th
Lowest,	—9.5, 28th
Mean,	25.3
Mean of means of max. and min.,	25 6
Mean sensible (wet bulb),	23.9
Monthly Range,	62.
Highest mean daily,	41.3, 13th
Lowest mean daily,	7.0, 24th
Mean maximum,	34.4
Mean minimum,	16 8
Mean daily range,	17.6
Greatest daily range,	32.5, 28th
Least daily range,	4.0, 23d

Humidity.

Mean dew point,	19.6
Mean force of vapor,	.153
Mean relative humidity,	79.8

Wind.

Prevailing Direction, west.

Summary.

North.	16 per cent.
North North West,	10 " "
North West,	10 " "
West.	10 " "
West South West,	16 " "
South West,	10 " "
Other directions,	28 " "

Total movement,	5290 m.
Greatest daily movement,	514 m., 16th
Least daily movement,	32m., 21st
Mean daily movement,	170.6 m.
Mean hourly velocity,	7.1 m.

Maximum pressure per square foot, 12 lbs. = 49 m. per hour, 16th 10·30 A. N.N.W., 19th 7 30 A. W.N.W.

Precipitation. In inches.

Total precipitation,	0.87
Number of days on which .01 inch or more rain or melted snow fell,	5
Snow total in inches,	3.

Weather.

Mean cloudiness observed,	42 per cent.
Total cloudiness recorded by the Sun Thermometer,	111 hours or 39 per cent.
Number of clear days,	11
Number of fair days,	12
Number of cloudy days,	8

Bright Sunshine.

Number of Hours recorded, 172 hours or 61%

Rain, 8th, 9th.

Gales, of 35 or more miles per hour, 42m., 9th, S.W.; 37m., 10th, W.N.W.; 49m., 16th, N.N.W.; 46m., 17th, N.N.W.; 49m., 19th, W.N.W.; 45m., 23d, N.; 35m., 24th, N.; 44m., 26th, W.; 36m., 31st, W.

Snow, ... 4th, 5th, 16th 18th, 23d.

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* Temperature in ground shelter.

† Reduced to freezing and sea level.

* * Determined from levels of B. & M. R. R.

DAILY SUMMARY.

DAY.	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE. GROUND SHELTER.							NUMBER OF HOURS BRIGHT SUNSHINE.
	MAXIMUM.	MINIMUM.	MEAN.	MAXIMUM.	TIME.	MINIMUM.	TIME.	MEAN OF MAX.&MIN.	MEAN HOURLY DRAPER.	MEAN SENSIBLE. WET BULB.	
1	30.46	30.31	30.357	28.5	2 P	14.	7 A	21.2	21.4	18.8	6
2	30.54	30.39	30.441	20.	3 P	14.	12 P	17.	17.	14.5	3
3	30.40	30.30	30.345	24.	3 P	9.	7 A	16.5	14.5	13.7	9
4	30.44	30.09	30.278	34.	12 P	8.	7 A	21.	22.	23.0	6
5	30.14	30.02	30.083	43.5	2 P	27.5	7 A	35.5	34.	32.3	8
6	30.14	30.00	30.055	51.	2 P	31.	3 A	41.	38.8	37.8	7
7	30.23	30.05	30.108	50.	2 P	28.	6 A	39.0	36.7	36.0	7
8	30.32	29.87	30.191	38.	2 P	22.5	7 A	30.3	30.8	31.0	2
9	29.87	29.37	29.503	44 5	2 P	32.	5 A	38.2	37.5	37.3	0
10	29.82	29.52	29.710	44.	1 P	35.	12 P	39.5	39.0	35.7	1
11	30.11	29.80	30.017	44.5	2 P	26.5	12 P	35.5	34.2	32.0	8
12	30.07	29.87	29.986	45.	2 P	23.5	6 A	34.2	34.2	34.3	8
13	29.87	29.62	29.694	52.5	2 P	33.	3 A	42.7	41.3	40.8	4
14	30.18	29.78	30.058	44.	2 P	27.	12 P	35.5	36.0	31.8	8
15	30.26	30.00	30.116	29.	2 P	16.5	7 A	22.7	22.9	21.2	6
16	30.00	29.78	29.821	26.5	3 P	18.5	5 A	22.5	23 2	21.	0
17	30.25	29.88	30.148	34.	2 P	21.	12 P	27.5	26.2	23.0	9
18	30.24	29.78	30.013	34.5	3 P	15.5	3 A	25.0	23.8	25.	0
19	30.06	29.78	29.960	26.5	3 A	16.	11 P	20.7	23.8	20.2	9
20	30.03	29.93	29.982	32.5	3 P	14.	4 A	23.3	20.5	19.2	7
21	29.96	29.86	29.911	33.	3 P	10.	6 A	21.5	21.0	20.8	5
22	30.00	29.91	29.976	28.	3 P	8.5	6 A	17.2	19.5	17.0	5
23	30.11	29.86	29.944	17.	1 A	13.	12 P	15.0	14.5	13.8	0
24	30.38	30.11	30.289	17.	2 P	–1.	6 A	8.	7.0	6.	9
25	30.46	30.32	30.408	25.	3 P	–3.5	5 A	10.7	12.2	12.5	7
26	30.44	30.08	30.167	33.	7 P	11.	0 A	22.	23 6	22.7	5
27	30.94	30.44	30 811	19.	3 P	–0.5	12 P	9.2	7.8	5.0	9
28	30.94	30.55	30.757	23.	3 P	–9.5	6 A	6.7	8.6	8.8	9
29	30.55	30.35	30.401	34.	2 P	10.5	7 A	22.2	23.1	22.5	6
30	30.39	30.06	30.253	45.	12 P	20.	3 A	32.5	31.6	31.8	0
31	30.66	30.08	30.397	44.	12 M	25.5	12 P	34.7	36.4	30.0	9

DAILY SUMMARY.

	HUMIDITY.			WIND.					PRECIPITATION.			
											TOTAL IN INCHES.	
DAY.	MEAN DEW POINT.	MEAN FORCE VAPOR.	MEAN RELATIVE HUMIDITY.	PREVAILING DIRECTION.	TOTAL MOVEMENT IN MILES.	MAX. PRESSURE PER SQ. FOOT.	MILES PER HOUR.	TIME.	BEGINNING.	ENDING.	RAIN.*	SNOW.
1	15.3	.113	82.3	W.S.W.	129	2.5	23	1-30 P				
2	6.7	.096	65.0	N.N.W.	200	4.5	30	1 P				
3	8.3	.091	76.7	W.	168	1.5	17	3 A				
4	20.3	.139	89.7	S.S.E.	126	4.	28	1 P	9 P	12 P		T.
5	30.0	.199	87.7	W.S W.	137	1.	14	1 A	0 A	6 A		T.
6	35.0	.257	82.7	S.S.E.	193	4.5	30	12 M				
7	34.0	.236	88.0	W.	84	0.5	10	2 P				
8	30.0	.180	95.7	W.S W.	39	0.	—	—	7 P	12 P		
9	35.0	.235	89.0	S.W.	141	9.	42	12-30 M	0 A	9 P	0.67	
10	32.7	.227	83.3	S.S.W.	213	7.	37	2 P				
11	29.3	.198	86.0	W.N.W	96	2.5	23	11 A				
12	32.0	.217	87.7	S.	134	0.5	10	7-30 A				
13	39.0	.280	89.0	S.W.	143	2.	20	2-30 P				
14	27.3	.203	77.3	N.W.	176	5 5	33	0 A				
15	15.7	.128	73.0	N.	263	3.5	26	9-30 P				
16	16.0	.125	74.3	N.	514	12.	49	10-30 A	0 A	12 M	0.03	0.50
17	16.0	.144	67.7	N.	392	10.5	46	6 A				
18	24.0	.139	96.3	N.W.	38	0.	—	—	1 P	8 P	0.01	0.50
19	14.7	.123	73.0	W.N.W	286	12.	49	7-30 A				
20	13.0	.120	71.7	W.	81	2.	20	3 P				
21	17.3	.126	83.3	E.S.E.	32	0.	—	—				
22	11.3	.108	72.7	N.W.	62	0.	—	—				
23	13.0	.085	97.7	N.	293	10.	45	10 P	0 A	4 P	0.16	2.00
24	−0.7	.066	71.3	N.N.W.	244	6.	35	0 A				
25	7.7	.091	76.3	W.S.W.	120	2.5	22	12 M				
26	15.0	.140	66.7	W.S.W.	237	9.5	44	3 P				
27	−3.0	.064	65.3	N.	257	5.	32	11-30 A				
28	4.7	.082	79.3	S.S.W.	50	0.5	10	9 P				
29	17.7	.143	78.3	S.	112	0.	—	—				
30	29.3	.193	86.0	S.W.	62	1.	14	6 P				
31	22.0	.201	62.0	N.N.W.	268	6.5	36	1 A				

*At base of tower. T=trace.

Annual Summary for 1896.

Pressure. In inches.

Maximum reduced to freezing,	30.60 Dec. 27, 12 P.
Minimum reduced to freezing,	28.42 Feb. 6, 11 30 P.
Maximum reduced to freezing and sea-level,	30.94 Dec. 27, 12 P.
Minimum reduced to freezing and sea-level,	28.72 Feb. 6, 11 30 P.
Mean reduced to freezing and sea-level,	* * *
Annual range,	2.22

* *Air Temperature.* In degrees Fahr.

Highest,	97. Aug. 12th
Lowest,	-14. Feb. 17th
Mean,	* *
Mean of means of max. and min.,	47.0
Mean sensible (wet bulb),	44.
Annual range,	111
Highest mean daily,	81 May 10th
Lowest mean daily,	-1.7 Feb. 17th
Mean maximum,	57.3
Mean minimum,	36.6
Mean daily range,	20.7
Greatest daily range,	47 Apr. 16th
Least daily range,	3 Oct. 5th

Humidity.

Mean dew point,	39.9
Mean force of vapor,	.422
Mean relative humidity,	76.9

Wind.

Prevailing Direction, West South West.

Summary.

North,	10 per cent.
South,	10 " "
South South West,	10 " "
West,	10 " "
South West,	7 " "
Other directions,	53 " "
Total movement,	59,198 miles
Greatest daily movement,	620 m. Mar. 4th
Least daily movement,	14 m. Feb. 1st
Mean daily movement,	161.7 miles
Mean hourly velocity,	6.7 "

Maximum pressure per square foot, 25lbs= 71 m. per hour on May 18th, at 8 a. m.

Precipitation. In inches.

Total precipitation, rain or melted snow,	39.66
Number of days on which .01 inch or more rain or melted snow fell,	108
Snow total in inches,	44

Weather.

Mean cloudiness observed,	49%
Total cloudiness recorded by Sun Thermometer,	2018 hours=46%
Number of clear days,	132
Number of fair days,	102
Number of cloudy days,	132

Bright Sunshine.

Number of hours recorded, . 2448 hours=54%

Dates of Frosts.

Last,	May 1st; May 20th in lowlands.
First,	Sept. 24th; Sept. 21st in lowlands.

Dates of Snow,

Last,	Apr. 7th
First,	Nov. 14th
Total days of sleighing,	31

Gales of 50 Miles per Hour.

Jan. 1st, 55m., W.N.W.; Jan. 4th, 52m. N. W.; Feb.2d, 50m.,W.N.W.; Feb.6th, 61m.,N.E.; Feb. 7th, 58m., W.N.W.; Feb. 11th, 68m. W.N.W.; Feb. 14th, 54m., W.; Feb. 19th, 70m., W.S.W.; Feb. 24th, 53m., W.; Feb. 29th, 57m., E.S.E.; Mar. 3d, 61m., N.N.W.; Mar. 4th, 62m., N.N.W.; Mar. 5th, 58m., N.; Mar. 8th, 56m., W.N.W.; Mar. 9th, 56m., N.W.; Mar. 12th, 59m., W.; Mar. 20th, 55m., W.N.W.; Mar. 27th., 52m., W.N.W.; Apr. 3d, 60m., N.W.; May 18th, 71m., W.; Aug. 26th, 50m., S.S.W.; Sept. 19th, 57m., S.W.; Nov. 6th, 55m., W.

* Temperature in ground shelter.

* * Record divided, part ground shelter, part tower shelter.

* * * See later bulletin.

LEONARD METCALF, Meteorologist.

JAMES L. BARTLETT, Observer.